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The Role of Education and Text Exposure in the Oral Production of L2 Greek Functional Morphology by Adult L1 English and L1 Albanian Speakers: The Case of Agreement and Perfective Aspect

Eleni Janko

PhD

2020

The Role of Education and Text Exposure in the Oral Production of L2 Greek Functional Morphology by Adult L1 English and L1 Albanian Speakers: The Case of Agreement and Perfective Aspect

Eleni Janko

A thesis submitted in partial fulfilment of the requirements of the University of Northumbria at Newcastle for the degree of Doctor of Philosophy

Research undertaken in the Faculty of Arts, Design & Social Sciences

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Abstract

A growing number of studies testing illiterate participants has shown that a lack of knowledge of the alphabetic representation of words has implications for language processing and attainment (e.g. Tarone et al. 2009; van de Craats and van Hout 2010; Young-Scholten and Strom 2006). With regard to processing, Tarone et al. (2009) found that less literate adult learners are much more likely to omit necessary verbal morphology than their literate peers. However, in general, there is very little empirical research testing the processing of morphosyntax by low-literacy adult learners. The present research aims to address this gap by testing the acquisition of morphosyntax by adult learners, who are low-educated in the L1.

In Experiment 1, learners of Greek were taught gender agreement through different modalities (text versus audio); the aim was to look at how these modalities affect the oral accuracy of inflectional morphology. The text group scored higher than the audio group in determiner agreement, while results for adjective agreement were mixed. Answers to an exit questionnaire revealed higher levels of metalinguistic awareness for the text group.

In Experiment 2, low-educated learners of Greek were tested on gender and number agreement, and past tense marking in order to see how the educational level influences the acquisition of these structures. Differences in gender agreement were not significant. However, learners produced simpler language in past tense formation, while increased length of residence was associated with increased fluency.

These results add empirical evidence to previous research with regard to the processing of morphosyntax by low-educated L2 learners. They also have theoretical implications for the comparison of noticing of L2 morphological forms by adult learners (e.g. Ellis 2017; Schmidt 2001). The current findings also have methodological implications, as they question the general belief that the existing research findings apply to all learners (Tarone et al. 2009). Thus, generating findings different to past studies indicates the need for further research with low-educated participants. Finally, the present findings have pedagogical implications for practitioners by informing them on how to implement teaching methodologies that cater to these learners' diverse needs.

Contents

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Declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work. I also confirm that this work fully acknowledges opinions, ideas and contributions from the work of others.

Any ethical clearance for the research presented in this thesis has been approved. Approval has been sought and granted by the Faculty Ethics Committee on May 18th 2017.

I declare that the Word Count of the Thesis is 79,676 words.

Name: Eleni Janko

Signature:

Date: 24th December 2020

Chapter 1 – Why investigate alphabetic print literacy?

1.1 Background

The majority of Second Language Acquisition (SLA) research is informed by data from participants who are highly educated and highly literate in their native language (L1). The tacit assumption is that the findings from this body of research will generalize to learners who have less schooling, including those who are illiterate. However, it is questionable 1) whether these findings represent the illiterate and the low-educated population, and 2) whether the theories framed from earlier studies can be applied to this population. This has implications for pedagogy.

Until the 1970s, literacy classes and materials in the United States were designed on the assumption that learners already possessed the basic literacy skills to learn the second language (L2) (van de Craats et al. 2006). This was not the case, following an immigration wave from Southeast Asia to the United States (US) in 1970s (Wringley and Guth 1992). It made it clear that immigrants – to the US – had little, if any, experience with the basic literacy skills of reading and writing. Fix et al. (2003: 1) stated that 'beginning in the mid-1990s, the number of naturalized citizens rose for the first time in decades, from 6.5 million to 11 million citizens by 2002', indicating that the influx of immigrants was only growing. They add that this, newly arrived group of citizens possessed poorer English language skills and less education than the already naturalised citizens did. This discrepancy in

educational background had implications for language use and was an indication that these learners were in need of instructional support.

The small number of earlier studies (e.g. Becker et al. 1977; Clahsen et al. 1983; Perdue 1993) were some of the first to indicate that literacy affects both first language (Dąbrowska in press; Ravid and Tolchinsky 2002) and second language acquisition. Even though these studies did not necessarily investigate literacy directly nor did they always report the learners' literacy levels, there were indications that the participants' performance was linked to their educational background, when the latter was reported. In other words, better education was linked with better language acquisition. The number of studies focusing on the effect of alphabetic literacy in L2 acquisition has been scarce since the 1970s. Therefore, it was not possible to draw any definite conclusions.

However, there is now some evidence showing that illiterate and low-literate adult L2 learners lag behind their more educated peers in numerous aspects of both metalinguistic and linguistic development (e.g. Condelli et al. 2003; Kurvers 2002; Kurvers et al. 2006; Tarone et al. 2009; Young-Scholten and Naeb 2010; Young-Scholten and Strom 2006). For instance, the focus of the more recent studies varied from identifying effective instructional practices for adult ESL (English as a Second Language) literacy students (Condelli et al. 2003) and examining low educated adults' metalinguistic awareness (Kurvers 2002) to determining adult illiterate learners' reading progress in the L2 (Young-Scholten and Strom 2006). All things considered, there is an

increased likelihood for these learners to fossilise at a less target-like stage (van de Craats et al. 2006). That is to say, they are more likely to acquire a 'basic variety' of the grammatical structures early on in the learning process without achieving the full acquisition of those structures.

While there have been some developments within research to engage with these participants, there have remained operational barriers. One of the main reasons why SLA researchers have neglected these learners is because the former have only looked for their participants in laboratory-like settings, such as schools, universities, and classrooms in general. It is very challenging for the researchers to gain access to communities outside of these settings, but also to gain the trust of these learners who might confront researchers with suspicion.

Furthermore, social settings influence the way we process language, which is why it is of great importance to study the cognitive processes of L2 acquisition in a variety of settings. This means that, these institutional laboratory-like settings may not be reflective of the true interpretation of L2 acquisition. For instance, Dąbrowska (in press) points out the effects of writing on vocabulary, phonology and grammar both at the individual (mental grammar) and at the community level (when language shared by a community of speakers is seen as a conventional system). She argues that, vocabulary benefits the most from writing because exposure to the written form is what leads to the expansion of vocabulary. We learn the majority of the words that we possess by being exposed to written texts (Dąbrowska

2009), since the vocabulary encountered in speech is learned just past the early stages of acquisition. In fact, even children's books contain more vocabulary than adults' casual conversations, whereas newspapers contain four times more rare words than speech.

High phonological awareness implies speech processing that is more efficient, which explains why highly literate learners outperform low literates on phonological tasks. Interestingly, this happens less so with syllables or rhymes and more when learners need to segment in the sub-syllabic level. This is because, knowledge of the alphabetic writing system leads to a more fine-grained analysis of speech (Dąbrowska in press). Phonemic awareness is intrinsically linked to reading because being able to link phonemes to graphemes, i.e. the smallest unit of the writing system, changes the way we process speech and helps in turn to read words that are unknown or hold no meaning. That way, we expand our vocabulary by adding new items to it.

Writing also has an effect on grammar. Studies show that L1 grammar is acquired by the time children go to school (e.g. see Hirsh-Pasek and Golinkoff 1999). However, there are structures that are more complex, such as full passives, the past perfect, some derivational affixes, and relative and subordinate clauses (Dąbrowska in press), which consequently take more time even past adolescence to acquire. This is possibly due to exposure to writing, where there are more chances for the speakers to encounter these complex structures. This implies that it might not be possible for those who

are not exposed to written texts largely to fully acquire these complex structures.

Exposure to print has correlated positively both with comprehension (Dąbrowska 2018; Street and Dąbrowska 2010) and production (Montag and MacDonald 2015) of these structures. Tarone et al. (2009), who looked at the acquisition of more complex aspects of the English L2 morpho-syntax in one of their experiments, also found that their low literate Somali participants were struggling with paying attention to form. The learners' oral production lacked nominal and verbal inflections, while they also tended to produce sentences simpler than their more literate counterparts. The researchers pointed out the need for further research with a specific focus on the acquisition of L2 morpho-syntax by illiterate, low literate or low educated learners in order to draw findings that are more conclusive.

There are several possible explanations for the observed differences between literate and less-literate language learners. First, it is possible that low literacy language learners are less familiar with the classroom-learning context and consequently find it difficult to learn in such a setting. Second, it is possible that the written form supports learning by providing a permanent, objective representation of the target language and allowing literate language learners to process target language utterances at their own pace. Third, learning to read and write results in improved metalinguistic abilities which and thus facilitates attention to form. The above are not mutually exclusive and it is most likely the case that all three are contributing factors. In the

current research, I focus specifically on the third possibility; that being literate supports acquisition by enhancing the ability to attend to form.

Nevertheless, there is no doubt that exposure to writing changes the way we perceive language and provides access to the use of more complex structures. The research gap identified by Tarone et al. (2009), grows even larger when we consider languages other than English, such as Spanish, French, or Greek. Such languages would be of great interest not only because they are understudied, but also due to their rich morphological system. In addition, the research conducted so far highlights the overall need for further research given the number of theories that need to be tested and the number of various settings in which these learners find themselves. For all of the above reasons, I decided to investigate the acquisition of L2 Greek morphology by studying how being alphabetically literate in the L1 influences the attention learners pay to form and whether this is reflected in their oral production through accuracy. In the next section, I will introduce the overall approach of the current research.

1.2 Current research

The focus of the current research is specific to the context of oral production. It primarily takes place with a focus on attention, including *the Noticing hypothesis* (Schmidt 2001). According to Schmidt, attention is necessary for L2 learning to take place. Noticing determines what the learner internalises, which in turn also determines the learner's output. Thus, this hypothesis is about how learners process the input they receive and whether they are able

to provide explanations based on how learning takes place. However, having internalised input does not necessarily lead to output, i.e. learner production, while noticing does not guarantee fluency. L2 learners can be fluent without being aware of noticing taking place and without being able to report aspects of the language verbally.

I specifically attend to attention to form, one of the aspects of the *Noticing hypothesis*, which is measured through the learners' accurate responses. This is in response to Tarone et al.'s (2009) emphasis on the research gap regarding the cognitive processes of these learners in morphosyntax, along with their findings that these learners produce speech simpler than their more literate counterparts do. As a result, this led me to the study of Greek inflectional morphology by L2 adult learners.

Schmidt (2001) also points out that in order to learn aspects of the L2 that are less salient or redundant (e.g. inflectional morphemes), attention becomes a 'practical necessity'. The Somali L2 learners of English in Tarone et al.'s (2009) study were fluent in the L2 despite the low literate group's inability to produce verbs with inflections more than half of the time. In addition, L2 learners worldwide still acquire the L2 and make a living in the host country despite lack of instruction. However, when they encounter aspects more complex than others, which are mostly encountered in writing, lack of exposure to print lowers their chances of learning these aspects. They cannot visualise those less salient aspects of speech without being exposed to print. Ellis' (2008, 2017) theory on *selective attention* is also

relevant to the current research. This is because, it expands on Schmidt's argument regarding salience and provides a detailed explanation of why L2 learners retain information about some features more than they do about others (for a detailed overview on *selective attention*, see Chapter 3, section 3.2). It could be the case that the *Noticing hypothesis* applies to the more complex aspects of language, such as subordinate clauses, passives and inflectional morphology, where explicit attention is necessary in order to draw the learners' attention to form.

The *Noticing hypothesis* was developed by having in mind the middle-class, highly educated learners in instructional settings. For instance, Schmidt (2001: 29) said: 'Since task demands are an equally important determinant of attentional focus, instructional practices that focus learners' attention on things that they are less likely to attend to or notice on their own also have a solid justification'. This statement clearly refers to learners in classrooms. However, statements like this one cannot be taken into consideration for L2 learners who do not have access to print and classrooms. Consequently, the chances of learning whether low educated L2 learners are able to pay attention to form diminish significantly, while it is not possible to test their abilities if researchers focus exclusively on instructional settings.

Given the key gaps in the literature, I developed the following research questions (RQs) and sub questions:

1. Does the presence of alphabetic print facilitate attention to form? If so:

    a. Does this contribute to a more accurate production of inflectional morphology in the L2?
    b. Does print facilitate generalisation of L2 morphology?
    c. Does print contribute to the acquisition of L2 morphology over time?
2. Can naturalistic adult learners with different levels of education acquire less salient aspects of the L2 without explicit instruction drawing their attention to form?
    a. If so, are they able to produce accurate output?
    b. If not, do they produce less complex language than their highly educated counterparts?

Inflectional morphemes are the centre of attention of my research. To answer the questions above, I designed two experiments. Experiment 1 was a smaller-scale, intervention study, where L2 learners of Greek were taught and tested on gender agreement (singular agreement, henceforth) through the software OpenSesame (Mathôt et al. 2012). The computerised experiment allowed for implicit teaching through individual sessions, as well the oral production-testing task with the researcher at the end of each session. These learners were highly educated, native speakers of English, who were taught singular agreement implicitly through comprehension and elicited oral production tasks.

The central aim of Experiment 1 was to look at how different modalities of exposure to alphabetic print would affect accuracy in the oral production of

inflectional morphology in the target language, i.e. singular agreement in L2 Greek. To achieve that, I created two versions of the same test, and randomly assigned participants to either group: one with text (text group) and one without text (audio group). The hypothesis was that the group exposed to text would be more accurate in its oral production of morphology than the group exposed solely to sound and pictures.

Furthermore, the learners were tested both on trained and untrained items in an immediate and delayed post-test. The general assumption was that the audio group would be at a greater disadvantage than the text group because it would not be able to visualise sounds due to lack of print. Lack of visualisation of text leads to challenges in manipulating the oral language phonemically (Bigelow and Watson 2014). I predicted that: a) the text group would outperform the audio group by producing responses that are more accurate; b) the text group would be more successful than the audio group in generalising the trained condition, and c) both groups' performance would drop in the delayed post-test a week after training, while there would be a larger gap in the performance of the audio group across time.

Experiment 2 was the main experiment of my research and investigated three structures: singular agreement, number agreement, and the perfective past tense in L2 Greek. For singular and number agreement, some of the materials were based on Konta (2012a), who tested children L2 learners of Greek in gender assignment and agreement. The research design for the perfective past tense was a partial replication of Clahsen et al. (2010), who

looked at the acquisition of the target structure by highly educated adult L2 learners of Greek. Thus, the findings of the current experiment were comparable to those of Clahsen et al. (2010). To test the acquisition of these features in naturalistic settings, I studied L1 Albanian learners of Greek who had not received any schooling in the L2. These learners differed in two aspects: the amount of schooling they have had in their L1 and the length of residence in Greece.

The goal of Experiment 2 was to look at how the educational level of the L1 influences the acquisition of these three structures in an understudied yet morphologically rich language like Greek. To achieve this, the learners were divided into two groups based on their literacy level. The aim was to compare the performance of the two groups based on the hypothesis that increased level of education would facilitate attention to form and, hence, lead to better attainment of grammatical distinctions with relatively low functional load. The learners' proficiency level was also measured through a spontaneous speech task in order to test whether high level of proficiency was linked to length of residence. I predicted that higher level of education would facilitate attention to form by enabling the highly educated group to produce more accurate responses, whereas increased length of residence would be associated to increased fluency in the L2.

1.3 Outline of the current thesis

After the current introduction, the follow-up chapters provide the reader with a detailed review of the relevant research background, as well as a review on

the theoretical framework around the key concept of *attention*. More specifically, in Chapter 2, I present a review of the empirical work conducted so far on the acquisition of oral skills. I present previous findings on the acquisition of the L2 oral skills by illiterate, low literate and low educated adult learners. Next, Idiscuss the main findings on the L1 oral skills by children and adults with respect to literacy and schooling.

In Chapter 3, I present the theoretical implications of the current research first by introducing the reader to the main theoretical framework, the *Noticing hypothesis* (Schmidt 2001) and Ellis' (2008) theory on learner selective attention. I also discuss Tarone et al's (2009) key study, who tested the *Noticing hypothesis* on low literate Somali learners of English and identified the research gap on the oral production of low literate L2 learners.

In Chapter 4, I introduce the reader to the linguistic background of nouns and nominal agreement in Greek. I also present some of the main studies conducted on agreement in Greek. In Chapter 5, I introduce the research design, results and discussion of Experiment 1, where I tested English learners of Greek in their oral production of agreement.

In Chapter 6, I provide a thorough linguistic and research background on the Perfective Past Tense (PPT), one of the three target structures of Experiment 2, with a particular focus on Clahsen and colleagues' studies (Clahsen et al. 2010; Stavrakaki and Clahsen 2009) on schooled children and highly educated adult learners of Greek. Chapter 7 introduces the reader

to the research design, results and discussion of Experiment 2, where I tested immersed Albanian learners of Greek on agreement and past tense production.

The thesis concludes with a General Discussion and Conclusions chapter (8), where I discuss the findings from the two current experiments, their limitations, as well as suggestions for future research.

Chapter 2 – Alphabetic Print Literacy and the Acquisition of Oral Skills

2.1 Introduction

In this chapter, I will discuss what we know about the effect of being literate in an alphabetic language and how print literacy has been claimed to affect oral processing of L1 and L2 acquisition. Language acquisition researchers have long neglected the study of literacy and its potential effects on language acquisition. However, there are a considerable number of illiterate adults worldwide. More specifically, 750 million adults remain illiterate, two thirds of who (437 million) are women (UNESCO Institute for Statistics 2017). The general assumption that a population under investigation is literate leads to lack of relevant research, since we do not know whether the existing findings are applicable to the illiterate or low literate population. Consequently, lack of relevant findings leads to the compromising of our understanding of these learners' language learning experience.

There has been a more substantial body of research on literacy in L1 acquisition than L2 acquisition (e.g. Castro-Caldas et al. 1998; Castro-Caldas and Reis 2003; Dellatolas et al. 2003; Kosmidis et al. 2004; Manly et al. 1999; Morais et al. 1979, 1986; Reis et al. 2003). These studies have focused their attention on how adults perceive and manage the processing of phonemes in their spoken L1. According to Kosmidis et al. (2006), illiterate or low-literate individuals have trouble processing information relevant to the phonemic characteristics of the language. Even at low levels, print literacy is

shown to be beneficial with respect to the manipulation of linguistic units, such as phonemes and syllables, with illiterate adults performing significantly worse than their relatively literate counterparts. The researchers have attributed this fact to lack of knowledge of the alphabetic representation of words, i.e. lack of awareness that the sounds produced by humans correspond to the graphemes used in writing. Even though these findings indicate that alphabetic print literacy allows individuals to visualise and manipulate oral language phonemically (Bigelow and Watson 2014), the research community has not yet arrived at a conclusion and the exact relationship between phonemic awareness and inflectional morphology still remains to be seen.

The existing body of research in adult L2 acquisition has neglected to address the issue of literacy. Furthermore, very little is known about non-literate adults who learn to read and write for the first time in the L2 or low-literate adults who acquire the oral skills of the L2 without receiving any schooling (e.g. Becker et al. 1977; Clahsen et al. 1983, Perdue 1993). The majority of SLA research has been conducted with literate, highly educated adults in the L1. For this reason, SLA theories might not be applicable to individuals with limited or no formal schooling. New studies need to be carried out in order to explore formal schooling as an influential factor of language acquisition (Tarone et al. 2009). Despite the emergence of relevant studies in the last two decades (e.g. Kurvers 2002, Tarone et al. 2009, Young-Scholten and Naeb 2010, Young-Scholten and Strom 2006), there is

constant need for further research due to the great number of different contexts and individuals.

This chapter focuses on literacy and the oral processing of language acquisition, starting with the definition of literacy. What follows next is the research carried out on L2 acquisition and its relation to literacy by presenting the key studies of the field. Finally, literacy and L1 acquisition are also discussed with a focus on oral processing of both children and adults.

2.2 Construct of Literacy

The term 'literacy' is extensively used both by organisations and by researchers. UNESCO is known for actively trying to lower the rates of illiteracy since the 1960s. It originally defined 'literacy' as the process of learning to read and write in order to prepare for the job market (Rassool 1999: 7). In the following years, literacy was estimated based on school completion, so that a more reliable tool of measurement existed. It was suggested that six to eight years of schooling was the minimum required in order for the individual to live up to the expectations of today's society. Thus, UNESCO's initial focus on a more functional perspective of literacy associated with the economic growth of the community added up to the individual's intellectual growth. The above definition referring to the acquisition of reading and writing skills is also known as the 'narrow view' of literacy, where one possesses the cognitive skills of reading and writing to convert spoken language into written language. Apart from individual development, reading, writing, and numeracy skills also contribute to the economic development of communities. This assumes that literate

individuals are in a position to contribute more than illiterate individuals are, since they possess more skills. Thus, it is to the benefit of the community to invest on the implementation of policies that will help eradicate illiteracy.

2.2.1 The 'Narrow View' of Literacy

The 'narrow view' of literacy involving the cognitive perspective, i.e. the skills of reading and writing, is nowadays viewed as the more "traditional" approach. Learning to read is a process that takes place in the head (Purcell-Gates et al. 2004) and phonological processing has been identified as an indicator of early reading success (Davidson 2010). Being alphabetically literate helps to realise that spoken language is represented by that alphabet and governed by grammatical structures, as well as that words are abstract representations of the things they refer to. Therefore, literacy brings awareness of the abstract nature of the language by helping the literate individual to realise that graphemes correspond to phonemes (Olson 2016). Olson (1996) provides two types of evidence as to how writing brings aspects of speech into consciousness: one is the particular case of Indians from the history of writing and the other is from children's studies on learning to read and write. The prairie Blackfoot Indians in the USA used picture-writing that represented events or things in order to convey information. However, according to the "traditional" view, where writing is seen as a means to record language (ibid.), picture-writing was not considered to be actual writing as it did not represent any words or sentences. For this reason, such records were ruled out as real evidence of writing as transcription of speech. On the other hand, Gaur (1987) and Harris (1986) argue that

‘writing’ was originally meant to convey information in order to avoid ambiguity in the language. Instead of merely transcribing speech, writing brings aspects of speech into consciousness (Olson 1996: 4). It constitutes a means to look into the workings of language in order to understand human reasoning. In other words, not only do literates gain insights on how spoken language is represented on paper but they also gain metalinguistic knowledge.

With respect to children, studies show that, before becoming literate, children are under the impression that words represent objects and not parts of speech (Olson 1996, 2002, 2016). Torrance and Olson (1987) tested children’s perceptions of words. In one of the examples, an illiterate child is shown a card with the phrase ‘three little pigs’. The researcher reads it to the child and the child produces an accurate repetition of the target phrase. Next, the researcher hides the final word of the phrase by asking the child what the phrase says now. The response this time was ‘two little pigs’, which indicated the child’s belief that each of the three words in the initial phrase was referring to each animal separately. Children realise that words are part of speech and represent language when they learn how to write. The symbols that they see are not symbols of objects anymore but constituents of speech. Therefore, words move from representing symbols of objects to representing objects of reflection. Children face many challenges when they attempt to convert speaking into writing or when they interpret the alphabetic printed word (Olson 2016).

Ferreiro and Teberosky (1982) tested children's perceptions of unillustrated written language produced by the researcher. The researchers wished to find out whether the children would be able to segment written text and match it to the enunciated words. The researcher wrote a sentence in front of the child and then read it by also pointing at the word enunciated each time. Next, the child was asked where each word was in the sentence (see transcript below):

> **1. Researcher (R)**: Where does it say *papá* (=dad)? in *papá patea la pelota* (=dad
> **2.** kicks the ball)
> **3. Child (C)**: points to *papá patea* (=dad kicks).
> **4. R**: Where does it say *pelota* (=ball)?
> **5. C**: points to *la pelota* (=the ball)
> **6. R**: Where does it say *la*?
> **7. C**: shakes head, "no"
>
> (Ferreiro and Teberosky 1982: 103)

Thus, children tended to divide the sentence in the main parts based on content (lines 3 and 5), while ignoring function words like articles (lines 6-7).

In the end, most of the children would learn to recognise the one-to-one relation between the printed and the enunciated word with the researcher's guidance. Interestingly, children would pass through stages before reaching that point. At first, they would assume that the printed word (symbol) directly represented the object. Next, they thought that print referred to parts of the utterance, specifically the referential content, regardless the number of words. For instance, when asked to indicate where *pelota* (=ball) was in the sentence (line 1), the child would point at *la pelota* (=the ball) (line 3), ignoring the definite article and focusing on the word that carried the main

meaning. In the final step, the child would manage to segment the sentence into single words by repeating it to himself or herself while observing the text (lines 4-8). In the transcript below, the child repeats and reflects on the words by looking at the sentence. Although the child managed to find the verb, the researcher needed to ask again before the child pointed at the article (lines 6-8):

> **1.R:** Where does it say *pelota*? (=ball)
> **2.C:** (Points to PATEA LA PELOTA=kicks the ball, but corrects
> 3.himself immediately.)
> 4.No! Here it says *pelota* (LA PELOTA), and here *papά* (PAPΆ
> 5.PATEA). *Papά patea*
> *6.la pelota…*(Repeating to himself). No! Here *papά* (PAPΆ) and here
> 7.*patea*
> 8.(PATEA).
> **9.R:** Where does it say *la?*
> **10.C:** (Reflects, saying to himself) *la patea…a la pelota* (=he kicks it…the ball) (points to LA).

(Ferreiro and Teberosky 1982: 103)

The researchers concluded that, for children, written language is not an accurate representation of the spoken language. Pre-schooled children perceive written and spoken language differently, which is evident by the fact that they do not expect to find all spoken words in writing (Ferreiro and Teberosky 1982: 104).

2.2.2 The ‘Broad View’ of Literacy

UNESCO’s definition of ‘literacy’ has shifted from describing a rather functional approach aiming at survival through the acquisition of basic skills to a more sociocultural view. This sociocultural view of literacy, otherwise known as ‘broad view’, is based on both the personal and the social

empowerment of the individual (Wickens and Sandlin 2007). Thus, the 'broad view' involves both the basic skills of reading and writing, and the social relationships that the individuals develop in society. For this reason, literacy definitions can differ from regional to national level depending on the context.

Researchers like Gee (2001, 2012) and Tracey and Morrow (2006) also emphasise the social side of literacy and argue that literacy is one's ability to embed one's self into society (see also *critical literacy skills*, McDonald and Thornley 2009). Gee (2012) introduces the term *Discourses* in order to describe language in its social context. *Discourses* refer to the behaviour that individuals implement depending on the social context surrounding them and on what the individual assumes is expected of him or her. Schools are said to promote such critical skills by developing the individual's print and numeracy skills along with what is considered the behavioural values of society. Since the first years of their lives, children are assigned the role of 'student' and are called to behave differently depending on which classroom they are in, which subject they are taught, and which teacher they have in front of them. Thus, the same child will be more than one type of student by using different *Discourses* in order to adjust to each social context.

Scribner and Cole (1981) wished to disentangle the notions of 'literacy' and 'schooling' by studying a literate unschooled community. For this reason, the researchers studied the psychological effects of literacy in the extraordinary society of the Vai in Liberia, in northwest Africa, for more than five years. The Vai have three distinct literacies: their own syllabary (words made out of

syllables), the Arabic alphabet, and the Latin alphabet. It is imperative at this point, though, to define 'literacy' under this specific context. For the Vai, 'literacy' refers to the accurate reciting of the Qur'an, while teaching is based on rote learning and takes place in Qur'anic schools. Consequently, the schooled do not possess any metalinguistic knowledge, while English is only used for government business. Despite the three forms of literacies, only one fifth of the male adult population was literate at the time of the study because the script was not part of routine education. What is more, difficulty of general access to education made it impossible for this poor part of Liberia to attend school. Thus, the only way for someone to become literate was to turn to a literate friend. This also means that the Vai become literate by choice during their adult life. Interestingly, literacy is not a sign of social class, nor is it withheld from those who express interest in it.

The researchers wished to find out how literacy changes people and whether different literacies change people differently. They tested three groups of participants, 650 in total: monoliterates in Vai or Arabic, biliterates, and non-literates. The literate participants were interviewed and tested on each literacy separately through interviews, cognitive tasks, and questionnaires. Overall, three main effects of literacy were detected. Firstly, a literate of the Vai script can put syllables together more naturally, which is expected by a literate of a syllabary script. Secondly, a literate is able to make better grammaticality judgements. Finally, he or she can communicate better in dictating a letter, which is also expected given that he practices the specific skill of letter writing. It is worth considering how localised and closely related

to the specific usage of the Vai script these results are while raising the question of whether they are applicable under a different context. A comparison analysis showed that even though the literate population did not perform any better than those with no alphabetic knowledge did, both schooling (English) and literacy (Vai script) contribute into providing clear instructions and grammatical explanations. The difference lies in that schooled individuals provided more elaborate and task-oriented explanations than unschooled individuals did. Thus, knowing how to read and write is not equal to going to school.

If seen from a cognitive perspective, being alphabetically literate helps to realise that spoken language is represented by that alphabet and that words are abstract representations of the things they refer to. However, this does not imply that spoken language is hierarchically superior to written language. Olson (1994, 2002, 2016) was the first to suggest that written language, and not spoken, defines human thought. It was common belief that writing comes secondary to language because it is the means to record spoken language. However, reading and writing evolved separately, so writing cannot be an accurate reproduction of speaking and can only be seen as evolving in a parallel manner to speaking. Once its users accept a writing system, talking is represented by a set of symbols that also show grammatical structures. Therefore, the literate individual gains awareness of the abstract nature of the language by realising that the graphemes used in writing correspond to phonemes, i.e. the sounds of the language.

Despite all of this, written language plays a much more important role than the decoding of the spoken language. Olson is also interested in how writing forms the human mind. The way we interpret writing defines the way we see and understand the world. Speakers of languages without written registers view language differently. Written language constitutes a means to look into the workings of language in order to understand human reasoning. In other words, not only does a literate individual gain insights on how spoken language is represented on paper but he or she also gains metalinguistic knowledge. For Olson, it is metalanguage that provides access to the type of rationality that written language made available to people. The author also argues that the control of our actions is a product of literate activities; literacy affects the mind in a way that a literate individual realises that the way he or she perceives the world is not the same as the world that exists outside of them. This distinction of the subjective and the objective originates from Norman's (1993) theory that cognition consists of the experiential and the reflective mode. The experiential mode refers to the way the mind perceives and reacts to events, while the reflective mode refers to thinking and decision-making. Therefore, literacy introduces the modern mind to a different type of consciousness and rationality that would not exist otherwise.

Olson (1996) provides two types of evidence as to how writing brings aspects of speech into consciousness: one is the particular case of Indians from the history of writing and the other is from children's studies on learning to read and write. Native Americans used picture writing that represented events or things in order to convey information. However, it cannot be argued

that picture writing was based on speech, since it did not represent any words or sentences. For this reason, such records were ruled out as real evidence of writing as transcription of speech. It was, nonetheless, a very interesting way of representing the events of the year. In addition, the Native Americans used this picture writing system as a mnemonic that helped them to link the events that marked that year with other personal events in order to be able to refer back to them.

Studies on children show that, before becoming literate, children are under the impression that words represent objects and not parts of speech (Olson, 1996, 2002, 2016). Children face many challenges when they attempt to convert spoken language into written form or interpret the alphabetic printed word. For this reason, the grasping of the alphabet is not a natural process nor is the realisation of segmentation and word boundaries (Olson, 2016). Children realise that words are part of speech and represent language when they learn how to write; for them, the symbols that they see are not symbols of objects anymore but constituents of speech. Therefore, words move from representing symbols of objects to representing objects of reflection. Ferreiro and Teberosky (1982) tested children's perceptions of unillustrated written language produced by the researcher. They wished to find out whether the children would be able to segment written text and match it to the enunciated words, meaning whether they possessed the ability to assume what was written in each segment. The researcher wrote a sentence in front of the child and then read it by also pointing at the word enunciated each time. Next, the child would be asked where each word was in the sentence (e.g.

‘where does it say pelota (=ball)?’) Children tended to divide the sentence in the main parts based on content, while ignoring function words like articles (e.g. R : ‘where does it say papa (=dad)?’ in papa patea la pelota (=dad kicks the ball). C : points to papa patea (=dad kicks). R: ‘where does it say pelota (=ball)?’ C: points to la pelota (=the ball). R: ‘where does it say la?’ C: shakes head, “no”) (Ferreiro and Teberosky, 1982: 103). When the child is asked where the word papa (=dad) is, he points at papa patea (=dad kicks). So, for the child, the relationship between the objects expressed by the verb is not represented independently. The researchers concluded that, for the children, written language is not an accurate representation of the spoken language.

Despite all of this, most of the children would realise the one-to-one relation between the printed and the enunciated word with the researcher’s guide. The interesting result is that children passed through stages before reaching that point. At first, they assumed that the printed word (symbol) directly represented the object. Next, they believed that print referred to parts of the utterance, specifically the referential content, before achieving the last stage. Torrance and Olson (1987) also tested children’s perceptions of words and produced findings similar to Ferreiro and Teberosky’s (1982) study. In one of the examples, an illiterate child is shown a card with the phrase ‘three little pigs’. The researcher reads it to the child and the child produces an accurate repetition of the target phrase. Next, the researcher hides the final word of the phrase by asking the child what the phrase says now. The response this time was ‘two little pigs’, which is evidence of the child’s belief that each of the three words in the initial phrase was referring to each animal separately.

While most researchers draw a line between the cognitive and the social aspects of literacy, Ravid and Tolchinsky (2002) consider them intertwined. The ability to control language both as a writing system and as discourse interprets as being linguistically literate. By 'writing system', the authors refer to written language as a notational system, while 'discourse' refers to the awareness that the literate individual possesses in that the language used in writing differs from the language used in speaking. For them, language development expands beyond preschool years and continues to take place throughout the lifespan.

Despite the fact that literacy starts long before schooling, younger children cannot be compared to adults or even older children. Adults possess larger vocabulary and are able to communicate in more complex ways than children are by combining different morphosyntactic structures. The adult's language acquisition increases through constant practice by responding to various communicative situations (Ravid and Tolchinsky 2002). Not only do literate adults possess a command of speaking and writing but they also possess the written language under the form of various registers and genres. The growing commands of the writing system and of written language enhance *rhetorical flexibility* and help to develop high analytical skills, which are necessary for metalinguistic reflection. *Rhetorical flexibility* refers to the speaker's/writer's need to hold the attention of the addressee. Thus, linguistic literacy depends on the availability of one's linguistic resources, as well as one's ability to access one's own knowledge. For these reasons,

literacy acquisition is not only a matter of being exposed to grammatical structures before schooling or of being exposed to alphabetic print during schooling.

To summarise, 'literacy' has been divided in 'narrow' and 'broad' view. The 'narrow view' is seen as the "traditional" view and consists of the cognitive skills of reading, writing and numeracy. On the other hand, the 'broad view' includes both the cognitive and the sociocultural aspects of literacy. Gee (2012) first used the term *Discourses* to show the social side of language by positing it in context, while Ravid and Tolchinsky (2002) use the term 'linguistic literacy' to refer to 'writing' both as a 'notational system' and as a 'discourse'. For them, 'discourse' entails the realisation that the language used in writing and in speaking differ. My study will only deal with writing as a 'notational system' and look at the effects of exposure to alphabetic print literacy in the acquisition of oral skills for adults. In the current research, literacy is dealt with in its broad sense, i.e. reading and writing skills and what this means in daily life (Faux and Watson, 2020: 124), and is operationalised by measuring the learner's reading skills in the L1 combined with their self-reports of formal education received in the L1. However, it is imperative at this point to introduce the research conducted on literacy and L2 acquisition.

2.3 Literacy and Second Language Acquisition

Ever since industrialisation, immigrants were considered to be equipped with the necessary linguistic tools that would help them to deal with the growing

demands of western societies. Assuming that all immigrants were well educated, the majority of research refers to the educated middle-class adolescent and adult population. The ease of gaining access to this population through schools and universities, the participants' availability and trust towards researchers, and the ease of obtaining written consent have contributed to the growth of findings. However, research has long neglected adults that are less educated in the L1 and that immigrate to literate westernised countries past the age of compulsory schooling due to political and financial instability (Young-Scholten 2015). Thus, low educated adult immigrants with varying L1 educational backgrounds have fewer chances than any other group of receiving any type of instruction during their stay. On top of that, lack of relevant research compromises our understanding of L2 learning and teaching, since teaching is based on what we know and what we know is based on the literate population (Young-Scholten 2013).

A few studies (Becker et al. 1977; Clahsen 1980, 1984; Clahsen et al. 1983; Meisel et al. 1981; Pienemann 1980, 2005) have found that certain participants, typically those with the lowest literacy levels, are much more likely to omit obligatory main verbs, grammatical markers of tense, as well as other grammatical morphemes compared to higher-literacy participants. This is an early indication that literacy is a key factor in the development of linguistic competence in the L2. The *Pidgin* project (Becker et al. 1977) and the *ZISA* projects (Clahsen and colleagues) on the developmental sequences of the L2 raised awareness of the research gap in studying the illiterate population. However, they did not use any objective literacy-

measurement tests in order to identify to what extent their findings were potentially linked to L1 literacy levels.

The key annual symposium in the field, *Literacy Education and Second Language Learning for Adults* (LESLLA), has contributed immensely in raising awareness on the research gap around literacy and adult L2 learners. Consequently, there has been a rise in the number of studies focusing on the illiterate and low educated population in the last decade.

The *ZISA* projects will be reviewed in the next chapter in more detail (Chapter 3, Section 3.4) as part of the potential theoretical implications, while I discuss the *Pidgin* project in the next section. Next, I discuss more recent contributions to the field, such as Kurvers' (2002) study on the metalinguistic awareness of first-time adult readers. Young-Scholten and Naeb (2010) and Young-Scholten and Strom (2006) addressed the question of critical period for learning to read after receiving L2 instruction in adulthood, while van de Craats and colleagues (Julien et al. 2016; van de Craats and van Hout, 2010) looked at L1 interference on the interlanguage of the L2. Finally, equally important research of the last decade is mentioned in section 2.3.5 on naturalistic and LESLLA learners specifically (Mocciaro, 2019; Vainikka and Young-Scholten, 2011; Vainikka et al., 2017).

2.3.1 The Heidelberger Project on Uninstructed Adult Immigrants in Germany

Becker et al. (1977) conducted a cross-sectional study of uninstructed adult immigrants in Germany, as there were suspicions that a pidgin language was starting to develop among them. The adult immigrants originated from a number of countries, such as Italy, Spain, Greece, Yugoslavia and Turkey (Young-Scholten 2013). They had received at least some years of education in the L1, while the lowest educated participants belonged in the lowest proficiency group. Participants were categorised based on years of residence (from up to 2 years to over 6 years) and tested through directed conversation techniques to elicit oral data.

On the basis of 100 successive utterances produced by each learner, the participants were categorised into four proficiency groups. The researchers found that the lowest group produced utterances without a finite element, a main verb or a subject. The data also showed that the lower literate learners differed in their development of morphosyntax compared to the more educated learners: for example, they overgeneralized the modal verb *Müssen* 'must' to mark tense (see Example 1).

1. Ich muss gesehen (=*yo ho le visto* 'I have seen it') Tomá A, L1 Spanish
   I must see-past
   (Ich habe das/es hesehen.)
   'I saw that/it.'

   (Young-Scholten 2013: 444)

According to the researchers, the *Müssen* overgeneralisation was probably due to its extensive use in the workplace.

Although the researchers' assumption was not supported, in that no pidgin was developing among the workers, this project showed that naturalistic learners follow similar stages of acquisition to instructed learners (Becker et al., 1977). However, rate of development varied based on other factors, such as job, interaction with native speakers, age at immigration, and importantly amount of formal education. Learners that had not completed primary education in their L1 belonged in the lowest proficiency group, while the higher educated participants' linguistic competence did not depend solely on their educational background.

Young-Scholten (2013) points out the gap in reporting literacy levels even in the small number of the existing studies. Even when level of education was noted as being low (Becker et al., 1977), there was no mention of literacy measurement. However, these early studies are a first attempt of considering literacy as an influential factor of L2 acquisition. This line of research follows the work described in section 2.4.

2.3.2 Metalinguistic Awareness in Low-educated Adults

In an attempt to determine whether it was age (development) or education (literacy) that played a more important role in the cognitive development of L2 acquisition, Kurvers (2002) investigated aspects of metalinguistic awareness among unschooled adults, low-educated literate adults, and pre-

school children from different L1 backgrounds. The non-literate adults were completely illiterate both in the L1 and in the L2 (Dutch), while the low-educated adults' years of schooling ranged from two to six years. The pre-reading children were in the last term of kindergarten. The participants were tested through tasks that measured awareness at the phonological, sentence, and discourse level.

The non-literate adults were illiterate in the L1 and somewhat literate in the L2 through the local course they took to learn Dutch, while the low-educated adults had no more than six years of schooling in their L1. The children were in the last term of kindergarten. The results show significant differences between the literate and non-literate adult groups, and between the literate adults and the children, but not between the non-literate adults and the children on the majority of tasks. In fact, on some measures, including rhyme, word segmentation, and word referent differentiation tasks, the non-literate adults exhibited more difficulties than the pre-schoolers did.

The researcher found that literacy played a more important role than age in L2 acquisition, as there were more differences between non-literate and low-literate adults than between children and non-literate adults. In seven of the tasks, the pre-school children did not exhibit any significant differences from the non-literate adults. Specifically, non-literate and low-literate adults presented significant differences in all language-awareness tasks (syllable-rhyme awareness, word awareness, and word and sentence segmentation), while patterns were detected between children and non-literate adults in

word length judgement and sentence segmentation. Similar to research in L1 acquisition, non-literate adults struggled the most with rhyme tasks, i.e. word segmentation and word referent differentiation where changing the name of an object would also change its qualities. This shows that their judgement relied on meaning more than it did on form.

With regard to sentence segmentation, the majority of the low-literate adults managed to segment sentences into isolated words. By contrast, children preferred segmentation into syllables or had mixed responses, while non-literate adults segmented based on meaning by creating either word groups or just dividing the sentence into two parts. In word segmentation, the adult readers were the only group that managed to successfully segment words into phonemes. Thus, non-literate adults bring different metalinguistic abilities from low-educated adults to the task of reading for the first time in a second language, while pre-school children and non-literate adults present several similarities in the processing of metalanguage, i.e. whether they perceive and possibly describe language based on the use of certain technical terminology. These findings support those of L1 acquisition studies previously reported, where illiterate adults resort to meaning instead of form in segmentation.

2.3.3 Reading-related Skills

In their study of adult L2 learners, Young-Scholten and Strom (2006) tested 19 adult immigrants learning English as an L2 in Seattle. Given the findings on pre-schooled children, who develop metalinguistic awareness after the

first two years of schooling, the researchers predicted that adults with some or no schooling at all would perform well on phonemic awareness tasks only after having received the relevant reading instruction and demonstrated the ability to decode. Thus, the researchers wished to identify the learners' progress. They tested the learners' phonological and morpho-syntactic competence in order to see whether the latter had reached a certain threshold, necessary for the acquisition of the reading skill. The participants originated from Somalia and Vietnam, while they differed in years of stay and instruction in L2 English. Eight of the 19 adults were illiterate, while the remaining 11 had received from one to five years of L1 education.

The researchers developed an extensive testing battery in order to measure the participants' literacy, metalinguistic awareness, and linguistic competence (see Young-Scholten and Strom 2006: 53). There were different tasks for the L1 and different for the L2, while for linguistic competence participants were tested only in the L2. All of the testing took place orally with the help of a bilingual interpreter except for the reading tests, where they had to determine whether participants could read in their L1. As for writing, participants had to write down basic personal information and were also tested on their environmental print reading through unordered letters of the alphabet. For decoding skills, participants were exposed both to frequent (e.g. *table, community*) and non-frequent (e.g. *penicillin*) vocabulary, where non-frequent words were treated as pseudo-words. Phonological awareness tasks were administered firstly in the L1 and then in the L2, while the word awareness task consisted of a simple story with familiar topics. Tasks on

syllable counting, onset rhyme odd-one-out (e.g. *albaab-hab-dam-anab*) and phoneme segmentation were followed by a morphosyntactic task in the L2 through picture description.

Similar to previous studies on young children and L1 late-literate adults (e.g. see Morais et al. 1979, 1986), Young-Scholten and Strom found that all adults possessed the necessary knowledge of the alphabet by being aware of words, syllables, and rhymes without, however, possessing any phonemic awareness. Thus, the results confirm the hypothesis that phonemic awareness appears alongside reading.

However, the researchers also found some differences between their participants and the children from past studies in that the two age groups have different repeating patterns and different awareness for the smaller units of the language. The adults were repeating content words at a higher frequency than function words. Contrary to the Vietnamese learners, the Somali participants displayed higher awareness of onsets and rhymes than of syllables. With respect to the link between alphabetic knowledge and reading skills, the adults did not show any decoding ability despite of all 17 participants' knowledge of the Roman alphabet, contrary to children studies. Overall, the researchers concluded that adult L2 learners are fundamentally the same as pre-school children. However, they differ from late-literate adult native speakers, who manage to acquire many aspects of their L1 before becoming literate. Even if the critical period is accountable to some extent for

the slow linguistic progress in unschooled adults, lack of exposure to the L2 seems to play a bigger role.

Young-Scholten and Naeb (2010) conducted a follow-up study in the UK, where they tested illiterate or relatively literate adults undertaking pre-entry ESL. The aim was to show that first-time L2 readers use the same mechanisms as children who read for the first time in the case where phonological awareness develops alongside reading. The task battery of the previous study was replicated with the addition of a test of words and vocabulary, while the participants of the follow-up study were not native speakers of a Roman alphabet. They were tested twice in a period of seven months (in June 2008 and March 2009) in order to determine whether they would follow the steps that the researchers had predicted.

Despite the fact that reading seemed to be a challenging and complex task for learners with no or very limited schooling, these learners also exhibited some improvement over time from one test to another. They specifically improved in their linguistic competence, reading skills, as well as their ability to process graphemes. The researchers also found correlations similar to past studies of children and LESLLA learners with regard to what learners were taught, to phonological awareness, environmental print, segments, and vocabulary (Young-Scholten and Naeb 2010: 86). The positive effects of these correlations include developments in these learners' cognitive processing of phonemes and graphemes, in their linguistic competence, and their reading skills.

Despite the patterns between the two groups, children and non-literate adults differ in several aspects. On the one hand, even in the case of low literacy in the L1, adults from countries with alphabetic scripts have been exposed to a great deal of printed materials. They also possess some understanding of syntax and of a more complex use of language. This, in turn, allows them to use functions cognitively higher than those involved in children's thinking (Thompkins and Binder 2003). On the other hand, children learn how to read for the first time in a language that they have been listening to for years. Illiterate adult L2 learners that lack basic reading skills in their L1 need to acquire the oral skills of a language completely unknown to them in a short period in order to survive (Young-Scholten 2013).

Overall, the similar patterns between the current study and past studies suggest that these learners use similar mechanisms with children, as well as that adults resort to latent cognitive resources when learning to read for the first time in the L2. Therefore, the finding that reading and the ability to segment to the phonemic level are interdependent extends beyond the L1 and applies to first-time L2 readers.

2.3.4 Interference of the L1 in L2 Interlanguage: The Case of Moroccan and Turkish Learners of Dutch

One of the few studies to look at the interlanguage of low educated L2 learners was van de Craats and van Hout (2010). The researchers specifically looked at the interlanguage of Moroccan learners of Dutch and

found that these learners overgeneralised the thematic verb *ga(at)* instead of the copula form *is*, like other learners, by using it as a dummy auxiliary in order to mark tense in their oral production. Thematic verbs have a root, a stem or *theme* vowel, and the tense and agreement suffixes are affixed to the stem vowel (e.g. *walk-s*). Auxiliaries, copulas and modals are non-thematic verbs.

The researchers wished to find out why these learners tended to overgeneralise the Dutch verb *gaat* ('to go'), especially since there is an extensive body of research showing that 'be' was the most common dummy auxiliary of three Germanic languages, i.e. German, English and Dutch (e.g. see Fleta 2003; Garcia Mayo et al. 2005; Haberzettl 2003; Huebner 1989; Ionin and Wexler 2001; Lee 2001; Starren 2001). Given that these studies produced the same finding despite the different L1 backgrounds (Turkish, Punjabi, Korean, Russian, and Basque-Spanish), van de Craats and van Hout turned to the influence of the participants' L1, Moroccan Arabic.

One of the existing auxiliaries in Moroccan Arabic, namely *gadi*, resembles the Dutch thematic verb *gaat* ('to go') phonologically, while Moroccan Arabic speakers also tend to shorten *gadi* to *gad* or even *ga* in conversational speech (van de Craats and van Hout, 2010: 480). Interestingly, *gadi* and *gaat* ('to go') resemble both phonologically and semantically, since the Moroccan Arabic auxiliary is also used to express movement and modifies the thematic verb as to time (future). Another reason for using a thematic verb in the place of a non-thematic verb is that Moroccan learners may face

problems with the pronunciation of the schwa in Dutch infinitives (e.g. *pakken* 'to take'), and of consonants as a result of inflectional suffix (e.g. *pak-t* 'you/he/she/it takes'). Thus, it is easier to use non-thematic verbs than to perform form-meaning mappings with thematic verbs. It is worth noting that children also resort to the use of *ga(at)* (2/3SG.PRES) as a dummy auxiliary followed by the infinitive of the target thematic verb (e.g. *slapen* 'to sleep').

E.g. poes ga slapen

Cat go.STEM sleep.INF

Target: de poes slaapt

'The cat sleeps.'

(Laura 3;6.9; Van Kampen 1997: 46)

That is because *gaan* ('to go') can also be used as non-thematic (auxiliary) to express near future. The use of the *ga*-pattern as a dummy auxiliary in Dutch has implications for what these learners consider to be the default form of the thematic verb *gaat* ('to go'), especially at the initial state of learning the L2: a short verb form that looks like a finite form (van de Craats and van Hout 2010: 475).

The Dutch learners were six Moroccan women, who had a very low education in their L1 and were attending classes as part of a programme for adult L2 learners of Dutch. At the start of data collection, the learners were beginners below level A1 of the Common European Framework (Council of Europe 2001) and were observed for 15 to 18 months (2003-2005) in three consecutive cycles of 5 to 6 months. The longitudinal data used for this study

were extracted from the LESLLA corpus collected in the Netherlands, while the most appropriate production tasks for this target structure were the film-retelling task 'Father and Daughter' and the picture storytelling task 'Snowman'.

The Moroccan learners produced four main sentence types with a thematic verb: *short verb forms, ga*-pattern, *is*-pattern, and *long verb forms*. The short verb forms constituted more than 72% of the responses of the two more advanced learners, whereas even the least advanced learner produced short verbs by 43%. A 2 (cycle) by 2 (proficiency) ANOVA showed a non-significant cycle effect, which means that no change occurred in the four patterns over time. This confirms one of the researchers' predictions that Moroccan learners have a preference for short verbs as default forms, which manifests in earlier stages, when a dummy auxiliary is linked to a short verb form. Contrary to past findings, all learners here linked the dummy auxiliaries to short thematic verbs before the appearance of long verbs.

There was a significant effect of proficiency for long forms (F (1, 4) =11.783, p = .026), short forms (F (1, 4) =7.932, p = .048), and the *is*-pattern (F (1, 4) =14.306, p = .019), while there were no significant interactions between cycle and proficiency. An ANOVA analysis comparing the frequencies of the *ga*-pattern and the *is*-pattern revealed that the *ga*-pattern is more frequent (F (1, 4) =61.801, p = .001), while there was also a significant effect for proficiency (F (1, 4) =10.503, p = .032). That is to say, the gap between the two patterns is larger for the more advanced learners. This confirms the researchers'

overall prediction that Moroccan learners produce dummy auxiliaries. The results showed that all learners produced dummy auxiliaries of both types, *ga*- and *is*- patterns, while the most advanced learners produced significantly more *ga*-patterns and less *is*-patterns than the less advanced learners did.

The data from the current study are also comparable to those of van de Craats (2009), where Turkish learners of Dutch produced no more than eight *ga*-patterns by carrying out the same tasks. The Moroccan learners produced 305 *ga*-patterns. A 2 (cycle) x 2 (language background) ANOVA revealed a significant effect for language background (F (1, 9) = 96.837, p = .000), which confirmed that native speakers of Moroccan Arabic produce significantly more *ga*-patterns than native speakers of Turkish.

To summarise, van de Craats and van Hout (2010) confirmed that the overgeneralisation of the thematic verb *gaat* is directly related to the learners' L1 by supporting the following: Moroccan learners of Dutch produce dummy auxiliaries, prefer short verbs as default forms, while *ga*-patterns appear before *is*-patterns, and are far more frequent and persistent. Not only did the use of *ga*-patterns in the more proficient learners not decrease but also there seemed to be a larger gap in the use of these two auxiliaries in these learners than in the less proficient ones. This is the case of L1 interference in language features, which are not as prominent as others are in speech and which present semantic and phonological similarities with the features of the L1 (for a detailed discussion on L1 interference, see Chapter 3, section 3.3).

To find out whether dummy auxiliaries are used by adult learners of Dutch only as a structural device for acquiring the morphological marking of agreement, and do not carry any meaning, Julien et al. (2016) conducted a follow-up study by investigating adult learners of Dutch as an additional language. As opposed to previous studies, Julien et al. distinguished speakers of Berber Tarifiyt from the Moroccan-Arabic speakers; this is important because the latter's population consists of Tarifiyt speakers by 60%. The participants were 40 adult learners of Dutch, who immigrated to the Netherlands after the age of sixteen and had not yet fully acquired verb inflection in the L2. Their overall educational level was low, with six of them never having attended school.

Julien et al. used a variety of production and comprehension experiments (e.g. looking at film clips and completing syntax tasks), eliciting the third person singular. E-prime 2.0 (Schneider et al., 2001) was used to present the tasks to the participants, while data was analysed with the software programs Microsoft Excel 2007 and IBM SPSS 21.

Results showed that all learners used dummy auxiliaries, while the researchers' prediction that higher level of proficiency would lead to a larger number of dummy auxiliary production was not confirmed. Julien et al.'s explanation (based on van de Craats, 2009) was that their participants had already been attending Dutch lessons for a period longer than nine months, which means that they probably were at a level more advanced than the one predicted by their CEFR level (A1 and A2). What is more, although language

background did not influence dummy auxiliary choice, Arabic-speaking learners performed better than the other two groups. In other words, positive transfer related to these learners' use of the auxiliary *gaan.*

Finally, with respect to assigning meaning to the constructions *zijn* +INF and *gaan* + INF, Julien et al. found that their participants used aspect arbitrarily since these learners matched both constructions with any of the three pictures portraying different aspect. In other words, the production of the two constructions does not mean that these learners apply the imperfective while being aware of its meaning, especially since they also used lexical items to express aspect. Julien et al. (2016) concluded that these learners' dummy auxiliaries are more 'decorative' than semantic, and they originate from the frequent use of the target constructions in the Dutch input.

2.3.5 Seminal Studies on Naturalistic and LESLLA Learners

Vainikka and Young-Scholten (2011) focused on adults' acquisition of German and specifically on the projection of the verb phrase (VP) in L2 German by looking at the progress of Americal secondary school students and learners of German, who participated in a year-long abroad program (Vainikka and Young-Scholten's American learners of German, VYSA). The aim of the VYSA study was to address the research gap regarding the lack of findings on naturalistic L2 data produced by lower-educated migrant workers. However, considering that the VYSA learners were assumed to be

cognitively more competent than low-skilled workers, Vainikka and Young-Scholten expected that the former would employ meta-cognitive strategies.

The three learners of the VYSA study, Joan, Paul and George, attended a four-week orientation course. In this first month, these learners were hardly exposed to any naturalistic input, spending their free, out-of-class time with their American classmates, while they only communicated with the English-speaking members of the host families. The students' comments made it clear that socialising with their American peers had a higher priority than the language course itself. The opposite was the case for the following eleven months of their stay in Germany. There was no evidence that Joan's or Paul's morphosyntactic development was shaped by these classes despite the assumption that they might put their meta-cognitive skills into use. However, George's responses and comments seem to have been influenced by instruction.

The learners were administered broad and narrow elicitation tasks on a monthly basis, while they also had informal conversations with the researchers. Results from the first recordings showed that none of the three learners had acquired the inflectional and the agreement phrases, with modals, auxiliaries, tense, and subject-verb agreement being almost non-existent in these learners' speech even after three months in Germany. However, this started to change in the second session, where some modals and auxiliaries started emerging in Joan's and George's speech. This can be explained by Vainikka and Young-Scholten's other studies (1994, 1996c),

which have shown that naturalistic learners acquire German word order relatively quickly. These findings show that the lack of projections related to the verb phrase starts to switch early on in L2 German acquisition, whereas the fact that learners project the VP at an early stage without, however, functional projections show that adults do not transfer their entire L1 syntax.

Based on the findings from the three learners, naturalistic learners seem to differ from instructed ones in the way they move from one developmental stage to another (as opposed to R. Ellis's claim in the 1990s). Vainikka and Young-Scholten suggest the existence of Grammar Lite, which seems to be an alternative way that the learner follows in order to produce utterances, based on the data that were made available to the learner upon instruction.

Vainikka and Young-Scholten point out the importance of individual differences in L2 acquisition and try to explain their findings by focusing on these differences. In the case of their German learners, literacy alone did not seem to be the source; if that were the case, the three learners would have behaved in a similar way (which was not the case). In addition, if amount of exposure to writing played a role in their case, Joan should have behaved similarly to George considering that their reading reports were similar, while Joan's exposure to writing was greater than George's. Thus, Vainikka and Young-Scholten concluded that, when it comes to the developmental stages of these learners, something other than literacy and amount of exposure to writing was probably the cause behind their differences.

The learners' metalinguistic awareness was assumed to be at a stage where meta-processes took place automatically given these learners' regular access to written text, as well as their overall schooling experience up to the university level. Although their performance was faster than that of other naturalistic adult learners of German, their metalinguistic awareness was not the expected one given their background, so individual differences had to be taken into consideration.

The learners' spontaneous comments, especially during the grammaticality judgement task, were used to assess their metalinguistic awareness. Paul seemed to pay more conscious attention to comprehension than forms, while Joan seemed to be more aware of language as an object than Paul was (e.g. she was aware that certain verbs use the auxiliary *sein* 'be' to form the past tense, while others use *haben* 'have'). Nonetheless, both Paul and Joan showed little conscious awareness of grammar overall. George, on the other hand, used more specific terminology (e.g. 'accusative') and recalled more of the content of the German course book from their orientation course, which could be due to his longer exposure to classroom foreign language instruction as well as the positive experience associated to the time spent in the classroom.

George performed better than Joan and Paul, both in accuracy and the variety of forms he produced. However, there seemed to be little if any progress in using case and gender more accurately the rest of the year. This differs from their acquisition of verbal morphosyntax, in which case they

showed some progress towards the end of the course. Overall, the VYSA learners seemed to be vaguely aware of certain forms.

In another study, Vainikka et al. (2017) looked at variables that played a role in the morphosyntactic development of English learners with various L1s (Arabic, Punjabi, Pahari, Dari and Urdu), who were also exposed to different types of input after post-puberty or had different educational backgrounds. Their aim was to examine the issues from Julien et al. (2016) along with further exploring the argument that L2 morphosyntactic development is uniform. They took the following variables into consideration: literacy level, formal education in home country and length of residence (LoR) abroad. They specifically wished to explore whether home language literacy made a difference in these learners' order of L2 acquisition by comparing English learners with and without home literacy or formal schooling from their home countries.

The argument that the development of L2 morphosyntax is uniform was based on research having concluded that post-puberty learners 'have access to the same innate mechanisms' (Vainikka et al., 2017: 2) as children. In other words, variables like educational background should not make a difference in the acquisition of syntax if universal grammar operates for adults as it does for children. Vainikka et al. used the theory of Organic Grammar (OG) in order to track these learners' order of acquisition. Although learners' initial morphosyntax is based on their L1, they fail to project any of this functional morphosyntax into their L2. According to OG, the stages for L2

English order of acquisition are: verb phrase (VP), negation phrase (NegP), tense phrase (TP), agreement phrase (AgrP), and complementiser phrase (CP).

The participants were living in the UK at the time of the testing, with none of the learners having been exposed to English prior to immigration. They varied in their literacy levels, formal education received in their home countries, as well as LoR abroad. Their oral production was tested through different tasks with pictures, such as sentence completion for VP word oder, comparison of slightly differing pictures for NegP, story retelling for TP, pictures and a card-game with habitual and on-going actions for AgrP, a 20-questions game with Wh- words, and sentence completion for CP. Comparing the various L1s to English, Arabic has a head-initial VP like English, while Urdu has a head-final VP. Tense and agreement are marked in both languages and there is a copula verb. Negation in Arabic involves two particles which precede the verb ‘ma’, which negates the verb in the past tense, and ‘la’, which negates the verb in the present tense. In Urdu, the negator ‘nahin’ precedes the verb. Vainikka et al. predicted that: a) Arabic speakers will transfer their head-initial Arabic VP and produce verb-object patterns rather than object-verb patterns, while Urdu speakers will do the reverse b) None of the learners will struggle with tense or agreement marking or copula ‘be’, and c) Negation will precede the verb. The learner’s use of the target form or construction was considered an indication of acquisition by the researchers.

Results showed that, with respect to the VP, learners transferred their L1 word order. Arabic speakers did not produce any object-verb word order, as opposed to the Urdu speakers (and speakers of related languages like Punjabi, Pahari and Dari) who sometimes did. Many of these learners also produced verb-object word order regardless of L1, which they probably acquired in English. With respect to the acquisition of functional syntax and projection of NegP, TP, AgrP and CP, learners were at different stages. Zabila, a speaker of Urdu and Punjabi, used a basic form of negation by producing 'no/not' without any auxiliaries. Her tense marking was almost non-existent (1 out of 10), while she used the copula 'be' half of the time. She also seemed to have over-generalised '-s' to various content words, as she used this with verbs regardless of whether the subject was in the third person singular or not. Four learners were at the NegP stage, meaning they were in the process of projecting that phrase: Amro (Arabic; 4/10), Imtiaz (Urdu; 7/7), Shafida (Pahari; 10/10) and Tazeem (Urdu; 10/10). At the time, they had started to produce function words and tense more frequently. Those participants at the TP stage seemed to be better with inflected forms (past tense '-ed' ending); they were all speakers of Arabic except for Sultani, who was a speaker of Dari. Finally, the four learners who were at the AgrP and CP stage used even more inflected forms ('be' as copula and auxiliary, and the third person singular), as well as more advanced syntax for example target-like questions and multiple clause utterances (ibid: 4).

Overall, learners were still in the process of figuring out how to mark the singular and plural forms, which persons are marked for agreement, as well

as what the differences are between the auxiliaries ‘do’ and ‘be’. The authors suggested that universal grammar helps these learners to use the projections TP and AgrP by realising that every projection requires a head without, however, fully understanding how or why. The latter explains why these learners use functional elements other than the target ones. The differences that occur among learners’ use of these projections could be based on the different stages they are at or the focus of the instruction they have received so far and their own attendance (similar to what Julien et al., 2016, argued). Regardless, both literate and non-literate learners acquired the target forms in the order predicted by the researchers based on the OG.

In a more recent study, Mocciaro (2019) looked at constructions that emerge in the interlanguage of low-literate L2 learners of Italian in order to fill the gap around the acquisition of Italian morphosyntax by the low literate population. Similar to Vainikka and Young-Scholten (2011) and Vainikka et al. (2017), Mocciaro specifically studied two types of construction, those resulting from the overgeneralisation of 1) auxiliaries and light verbs, such as *fare* ‘I do’, and 2) prepositions, such as *per* ‘for’ (as . These strategies that the low literate learners use, also known as ‘interlanguage constructions’ (ICs), occur temporarily as a result of the lack of the target morphosyntactic means in the learners’ speech.

The Italian language for Foreigners (ItaStra) developed a reliable literacy test, which was taken by 774 migrants with different backgrounds (e.g. North Africa, Sub-Saharan Africa and China). Twenty newly-arrived learners from

Western Africa and Bangladesh were recruited through this test; they were young male adults, aged between 18 and 30 years old. They were added in three literacy groups: learners belonging in Group 1 were not able to read or write isolated words in any writing system. Learners of Group 2 showed a low level of literacy by being able to recognise letters, make sense of isolated words and write their own name. Finally, Group 3 consisted of the literate learners.

ItaStra conducted a longitudinal study by collecting data through five sessions over 13 months. These sessions consisted of a language and literacy test, interviews and narratives. Findings showed that learners were able to identify those elements in speech that convey grammatical meaning, as well as when morphosyntax is needed in speech (e.g., that verbs need to be associated with grammatical meaning). More interestingly, Groups 1 and 2 used ICs to mark morphosyntactic relations in their speech, with Group 3 doing so much more inconsistently. In other words, low literacy contributed to a wider use of those constructions that learners usually turn to because they have not acquired the grammatical constructions yet.

Haznedar (2003) investigated the reasons behind the L2 learners' failure to produce verbal inflectional morphology and came up with the Missing Surface Inflection hypothesis, according to which L2 learners fail to apply their knowledge of inflectional morphology due to an issue with the realisation of surface morphology. This contradicts the *failed functional features* hypothesis (Eubank, 1996; Meisel, 1997; Vainikka and Young-Scholten, 1994, 1996a, 1996b, 1998), where inability of the L2 learner to

produce overt inflections is considered an impairment and failure to having acquired this aspect of interlanguage. However, Haznedar (see also Haznedar and Schwartz, 1997; Haznedar, 2001; Lardiere, 1998a, b, 2000; Prévost and White, 2000a, b) argues that lack of overt morphology does not mean that the L2 learner has failed to learn it, since overt inflectional morphology is not the only indication of interlanguage. The use of other features, such as auxiliaries and temporal adverbs, shows that associated functional categories are not absent just because they do not appear through overt inflections. It seems that learners need to go through certain stages, where they produce other elements of interlanguage before overt inflections. This could be the case especially for lower-educated adult L2 learners, whose attention has not been drawn explicitly to inflections through instruction. Thus, it is possible that even in cases of having failed to produce this overt morphology, these learners still have managed to learn the function of the said morphology. Being able to produce it might be another level of their inter-developmental stage.

2.4 Literacy and First Language Acquisition

Literacy development was considered to start with schooling when children were first exposed to alphabetic print. However, it is now widely accepted that literacy development starts long before schooling with ‘home’ being the first literacy environment to which children are exposed (Gillen and Hall 2003).

Normally developing children and adults process sounds differently. Although infants do not attend to sounds and images selectively like adults do, they detect all sound frequencies by the time they are six months old (Werner 2007). These differences in listening strategies are attributed to immature sensory processes, which develop over time (Bargones and Werner 1994; Werner 2007). In turn, these listening limitations might restrain children's ability to deduce information from speech when there is background noise, since they are not able to isolate that noise and concentrate on language (Bailey and Snowling 2002). However, listening strategies and processing of the oral language develop significantly in early childhood years.

It is also worth referring to the status of the family as an influential factor of literacy development. There are relatively few instances where literacy learning takes place at homes with a low socio-economic background. Smith's (1971) book *Understanding Reading* expanded the reading-related research (Gillen and Hall 2012). His analysis contributed to the emergence of *early childhood literacy*, as well as to the disclosure of the strategies used by young children in reading. *Early childhood literacy*, otherwise known as *emergent literacy*, has to do with the skills and knowledge an individual develops early in life through environments that support this development, and that lead later in life to the acquisition of reading and writing (Whitehurst and Lonigan 1998). Emergent literacy is considered to begin from birth until the pre-school years. The young child becomes aware of sound patterns in spoken language, recognises words, and builds its oral language and vocabulary skills (Gillen and Hall 2012). This is one of the characteristics,

among others, that Gillen and Hall (2003: 10) attribute to *early childhood literacy:*

> 'It is a concept that allows early childhood to be seen as a state in which people use literacy as it is appropriate, meaningful and useful to them, rather than a stage on a path to some future literate state. It is not about emergence or becoming literate, it is about being literate; and it allows the literacy practices and products of early childhood to be acknowledged as valid in their own right, rather than perceived as inadequate manifestations of adult literacy.'

It was now made clear that children also assigned meaning to print through their own strategies, and that they also represented language through their own scripts and symbols. Home-based factors and exposure to an urban environment exhibiting print everywhere carry great weight in the development of literacy (Ferreiro and Teberosky 1982; Storch and Whitehurst 2001). Variables, such as the parents' educational background, literacy resources (e.g. number of books in the home), literacy activities (e.g. library visits), parent-child reading interactions (e.g. storybook exposure), and parent-child engagement in writing activities (e.g. name writing) are significantly related to the child's overall success in school (see Phillips and Lonigan 2009; Puranik et al. 2018; Senechal et al. 1998). In order to figure out these strategies, researchers started studying children's behaviour while they were engaged in literacy activities.

During 'home literacy', children make assumptions about the written language that are an indication of later reading achievement, while school literacy comes to either disprove or build on these assumptions in order to create solid knowledge about language. Previous findings showed a

correlation between the type of home literacy activities, such as shared book reading, and the various emergent literacy skills. However, shared reading activities per se might not determine advanced oral skills. Rather, the high frequency of shared reading activities occurring in households with more educated parents might be the determining factor. Comparison of families with different social backgrounds showed that children from typical middle-class families were exposed to 1,000 or more hours of one-to-one picture book reading. On the contrary, children from low-income families with were exposed only to 25 hours of book reading activities (see Adams 1990). Consequently, children originating from low-income families are at risk of having poorer skills before entering school, and have more chances of facing later reading difficulties.

There is also evidence to suggest that literacy is strongly related to metalinguistic awareness of other aspects of L1 development, such as grammaticality judgement and syntactic comprehension (Karanth et al. 1995), the ability to attend to the smallest sized units (Havron et al. 2018), and awareness of morphology (Duncan et al. 2009; Nunes et al. 2006). In the next section, I will deal with these studies of pre-literate and literate children in order to show how lack of alphabetic print literacy, and hence metalinguistic awareness, influences children's processing of spoken language.

2.4.1 Oral Processing and Child Literacy

As noted, before learning how to read and write, children are under the impression that printed language consists of symbols for objects instead of constituents of speech (see Ferreiro and Teberosky 1982; Torrance and Olson 1987). Children's perception of language comes with the development of *phonological awareness*, a critical feature of literacy acquisition. *Phonological awareness* refers to the individual's skill to access and manage the sound units of language. However, a beginner reader with no knowledge of the letters of the alphabet is not aware which sounds relate to which letters (Whitehurst and Lonigan 1998). Children firstly acquire the segmentation of larger parts of speech, such as sentences into words, and only after schooling are they able to segment words into smaller units, such as syllables and morphemes (Alloway et al. 2004). That is because knowledge of the sounds of individual letters is required in order to be able to link speech sounds to alphabetic print. Children in the late pre-school age are nevertheless able to differentiate among sound units, such as phonemes, words, and propositions.

In earlier studies, Karanth and colleagues (Karanth 1984; Karanth and Suchitra 1993; Karanth et al. 1991) generated interesting data regarding grammaticality judgments on both children and adults. More specifically, they found that children under the age of 6 were not able to apply grammaticality judgments, while they became highly proficient by the age of 8 and reached adult-like performance by the age of 14. This reinforced previous theories that metalinguistic awareness occurs during middle childhood. However, the

researchers also found significant differences between literate and illiterate adults on the grammaticality judgment task (Karanth et al. 1991). Some illiterates refused to provide any answers and when they did, their answers were mostly random. Thus, the researchers concluded that formal schooling and learning to read affected grammaticality judgments, while the fact that children's proficiency in this aspect of metalinguistic development increased at the age at which schooling begins reinforces this conclusion.

Considering the above, Karanth et al. (1995) compared school-going (n=50) and nonschool-going children (n=50) and literate and illiterate adult speakers of Kannada (spoken mainly in south western India) on grammaticality judgement and syntactic comprehension tasks. The researchers wished to find out the extent to which literacy influenced the manifestation of metalinguistic skills in children and what the ramifications of the underdevelopment of these skills were in everyday language use in illiterate adults.

The school-going child group had received continuous formal schooling until the time of the testing, while the nonschool-going child group had less than one continuous year of formal schooling. The literate adult group (*n*=30) had an average of 14.67 years of formal schooling, while the illiterate adult group (*n*=30) had not received any formal instruction. All participants were native speakers of Kannada (age range 21-40 years). Their judgment abilities were examined through 130 test items, which covered a wide range of syntactic structures (e.g. morphophonemic structures, plural forms, tenses, case

markers and participial constructions) and were presented aurally. The participants' task was to judge the utterance for grammatical acceptability (Karanth et al. 1995: 307). An additional 110 testing items were administered in order to test the participants' comprehension and expression of the same syntactic structures as in the previous test through picture pointing and picture description tasks.

Results revealed a gradual increase in the scores of both child groups with a larger increase for the school-going group (an increase of 10.95% as opposed to 7.55% for the nonschool-going group). There was also an abrupt increase in performance at about 8 years of age for the school-going group, which also demonstrated higher scores than the nonschool-going group in each age group. An analysis of variance revealed significant main effects of both literacy and age, and a significant interaction between the two on grammaticality judgment. Interestingly, the grammaticality sensitivity index A' (Linebarger et al. 1983) revealed that the nonschool-going children performed poorer than the school-going children across the entire age range (6 to 11 years of age). The average A' value (A' = 0.69) for the oldest nonschool-going group (10-11 years) was comparable to that of the youngest school-going group (6-7 years, A' = 0.62).

Syntactic comprehension turned out to be more difficult for both groups, which had lower scores than in the grammaticality judgment task. However, the school-going group scored the maximum possible of 55 by the age of 9, while the nonschool-going group did not reach the maximum score even by

the age of 11. It was not possible to quantify the responses of the youngest nonschool-going group due to a lack of adequate responses.

Findings were similar for the adult groups. On the judgment task, the literate group scored a mean of 92.9 out of 100, while the illiterate group achieved a mean of 72.7. A *t* test revealed that the differences between the two groups regarding grammaticality sensitivity were significant at the 0.01 level across all subtests. In the syntactic comprehension task, the literate group performed at ceiling, while the illiterate group scored higher in some (e.g. plural forms, case markers, and sentence types) than in other structures (e.g. participial constructions, causatives, tenses and morphophonemic transformations). The researchers pointed out that the latter structures are bound morphemes in Kannada, while there were significant differences in the performance of the two groups in participial constructions and predicates.

Moving to the syntactic expression tasks, where participants had to describe pictures, the literate group tended to reply with full sentences, as opposed to the illiterate group, which usually provided single-word answers with shorter descriptions and less complex language. For instance, if the picture depicted a girl drinking water from a glass and the expected response was *avalu kudiyutiddale* 'she is drinking', the literate participant's response was the expected response, while the illiterate participant's response was *kudiyutiddale* 'drinking' (Karanth et al. 1995: 313). Although the gender is implied, the response is incomplete due to the lack of *avalu*. Therefore, these findings support the view that formal schooling enhances metalinguistic

awareness. Despite the fact that both child groups and both adult groups had some common metalinguistic skills, there is no doubt that the schooled individuals outperformed the unschooled ones.

Havron et al. (2018) explored the impact of literacy acquisition on children's learning of an artificial language. In particular, they compared children's success in learning novel noun labels (e.g., *keba* 'clock', *nadi* 'chair') relative to their success in learning article-noun gender agreement (e.g., *do*(article)-*kebi*(cup), *bu*(article)-*guni*(spoon)), before and after the children had learned to read. This was based on the hypothesis that larger units, such as phrases where words are linked through grammatical gender, facilitate language learning due to the grammatical relations they create between single-word units (vocabulary). This way, the learner's attention might shift from the multiword to the single-word unit, which is beneficial for the learning of new vocabulary. Thus, the researchers predicted that preliterate children in the first grade (mean age 6;45) would be better at article-noun agreement than at learning nouns. After becoming literate, they predicted that the advantage of learning larger units versus smaller units would be reduced in the third grade (mean age 8;89). Therefore, literacy would have a better effect on vocabulary. Only the first graders were expected to demonstrate a significant difference in the learning patterns after six months with the literate group performing equally well in both sessions.

In the first session, children were asked to name objects as a vocabulary measure. Next, children learned the artificial language by seeing objects and

hearing their matching descriptions. The sentences started with a carrier phrase (e.g. *kamek*) followed by the article (e.g. *do*) and the noun (*tibo*), while the content of these differed in the second session so that the children would not rely on memory. In the testing phase, children were asked which noun represents which object (vocabulary) and which article appears with which noun (agreement). The session ended with the literacy assessment, where children were rated on having read a paragraph in Hebrew. The second session started with the artificial-language learning task with different carriers and noun phrases, followed by a digit span task in order to test working memory, and a second literacy assessment task. In the test phase, the children were asked to judge whether sentences uttered by an alien appearing on the screen were correct or not. Half of the sentences tested vocabulary, i.e. whether the label matched the object, and the other half tested agreement, i.e. whether the utterance contained the correct article for that label.

In the first session of the language learning task, the first graders showed some learning of agreement (M=64.11%, SD=16.69%) but scored at chance in the noun-labels (M=50%, SD=13.69%). In the second session, the first graders scored higher in noun-labels (M=56.85%, SD=17.63%), while the difference with the agreement score was smaller than in the first session (M=60.48%, SD=18.57%). The preliterates' literacy skills improved significantly in the second session (t (60)=13.06, $p < 0.001$), while third graders outperformed first graders in the digit span task (first graders mean=6.03, SD=1.26; third graders mean=7.23, SD=1.22; t(54.87)=3.53,

p<0.001). The third graders also had a larger productive vocabulary (*t (*55.53) = 3.23, *p* = 0.002). A linear regression analysis revealed a significant effect of age group (β = 0.145, SE = 0.067, *p = 0.03*) with the preliterates showing better learning of agreement than of nouns. Productive vocabulary score and short-term memory score were not significant predictors, while the literate group was equally good on both trials (*t* (48)=0.39, *p* = 0.35). Therefore, although preliterate children learned which article corresponded to which noun-label, they seemed to face difficulties in mapping the article to the noun. However, they were better at learning agreement than at learning nouns.

In the second session, the researchers' prediction that the ex-preliterate group would not show an advantage over agreement was supported by the findings. Age group was not a significant predictor anymore (β = 0.032, SE = 0.076, *p* = 0.68), whereas the first graders showed a significant change in the difference between agreement and noun trials after learning to read, with difference in performance dropping from 12.89% on the first session to 3.63% in the second (*t(*30) = 2.03, *p* = 0.03, *d* = - 3.18). These findings suggest that literacy affects not only language processing, but also leads to important differences in language learning. That is to say, being literate allows children to attend to smaller sized units.

Duncan et al. (2009) conducted a cross-linguistic comparison of metalinguistic development in French and English examining early ability to manipulate derivational suffixes in oral language games as a function of

chronological age, receptive vocabulary, and year of schooling. The overall aim of their exploratory study was to gain more insight around the linguistic factors that determine the acquisition of derivational morphology by associating data on the development of L1 morphological awareness. The first objective was to identify whether the shift from implicit to explicit knowledge regarding derivational morphology took place during the first year of schooling, and whether this shift was conditional to the highly productive suffix *–er* (the equivalent of *-eur* in French) or whether it also expanded to other suffixes. The prediction was that the shift to explicit knowledge would be more advanced for the suffix *–er* (and *–eur* in French). The second objective was to run cross-linguistic comparisons of school-aged children's relevant knowledge in order to support previous findings that French children are more advanced than English children. In other words, the researchers interpreted the findings in relation to the word formation systems of English and French, and the educational context in each country. The prediction was that metamorphological awareness would develop earlier in French children due to the language's richer and relatively transparent morphology, and early schooling in French.

To achieve the above, the researchers designed two experiments relating metamorphological knowledge to maturational level, operationalised as year of schooling (Experiment 1), and to educational level, operationalised as chronological age (Experiment 2). Each group consisted of 15 children with average ages of 6;1 in Grade 1 and 8 years in Grade 3. The speakers were tested in a lexical judgment task, and a lexical and non-lexical production

task with background measures for receptive vocabulary and word recognition preceding the experimental tasks. All tasks tested oral judgment and production; the children were not exposed to the written mode.

In the lexical judgment task, the children were exposed to 10 target pairs and 10 foil pairs in their respective language and had to decide whether two words belonged to the same morphological family (e.g. *heat – heater*) or not (e.g. *ham – hammer)*. In the lexical production task, the children were tested in 10 sentence frames, where they were asked to produce a derivation in order to complete a sentence uttered by the researcher (e.g. *someone who runs is a . . .*? [*runner*]). In the non-lexical production task, the children were exposed to the same sentence frames but their task was to produce non-lexical derivations from either a word root (e.g. *someone who needs is a . . .?* [*needer*]) or a non-word root (e.g. *someone who lums is a . . .* .? [*lummer*]). This task aimed at assessing the children's explicit morphological knowledge in more depth.

The researchers ran a cross-sectional analysis, where they compared the two languages across the first and the third schooling year. The first year is a good indicator of morphological development in the pre-school years, while year 3 shows the children's progress on morphology as a result of the instruction that they received.

In the judgment task of Experiment 1, all children demonstrated similar sensitivity to morphological relatedness across languages, while

morphological development evolved at a similar pace (English Grade 1: mean=65.18%, SD=11.01; French Grade 1: mean=75.33%, SD=13.43; English Grade 3: mean=75.19%, SD=10.33; French Grade 3: mean=83%, SD=11.31). The performance of each group was significantly above chance (English Grade 1: t (14) = 5.34, p < .001; English Grade 3: t (14) = 6.27, p < .001; French Grade 1: t (14) = 7.31, p < .001; French Grade 3: t (14) = 11.30, p < .001). Morphological relatedness refers to the ability to distinguish the different morphemes in two words in order to identify the common root. There was a main effect of language (F (1, 56) = 7.21, p < .05, η^2_p = .11) and school year (F (1, 56) = 6.98, p < .05, η^2_p = .11) but no significant interaction (F < 1). Thus, French and English children demonstrate similar competencies in morphological awareness by the age of eight. Rise in the number of derivations for English children starts after the age of eight, while there is need for comparable research for French children.

In the lexical production task of Experiment 1, the English group had much lower scores than in the judgment task, which was not the case for the French group (English Grade 1: mean=20%, SD=13.63; French Grade 1: mean=70%, SD=15.12; English Grade 3: mean=39.33%, SD=10.33%; French Grade 3: mean=80%, SD=13.63). A 2 (language) by 2 (school year) ANOVA revealed significant main effects of language (F (1, 56) = 174.49, p < .001, η^2_p = .76) and school year (F (1, 56) = 18.26, p < .001, η^2_p = .25) but no significant interaction between the two. Thus, the French group produced the most accurate responses, while both groups showed a significant improvement over time. Scores in the non-lexical production task were the

lowest of all tasks with the French group still achieving higher scores than the English group (see Table 2.1).

Table 2-1 Experiment 1 means and standard deviations for performance ages on background measures and accuracy in the non-lexical production task for each language group according to year of schooling (Duncan et al. 2009: 416)

	English				*French*			
	Grade 1		*Grade 3*		*Grade 1*		*Grade 3*	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Word root	*16.67*	*7.24*	*22*	*16.56*	*38.67*	*13.02*	*53.33*	*13.97*
Non-word root	*12.67*	*7.99*	*23.33*	*13.45*	*25.33*	*7.43*	*40.67*	*15.34*

A three-way mixed ANOVA (Language x School Year x Condition) revealed significant effects of all three factors (Language: F (1, 56)=56.55, p< .001, η^2_p = .50; School Year: F(1, 56)=17.23, p < .001, η^2_p = .24; Condition: F(1, 56)=20.16, p< .001, η^2_p = .27;). This means that both groups improved the same in production from Year 1 to Year 3. Only the interaction between condition and language turned out to be significant (F (1, 56)=13.36, p< .005, η^2_p = .19) with simple effects revealing a significant advantage for word over non-word root conditions only for the French group (F(1, 56)=33.18, p< .001).

A comparison between the lexical and non-lexical production tasks of Experiment 1 by a three-way mixed ANOVA revealed a significant Condition x Language x School Year interaction (F (2, 112) = 3.50, p < .05, η^2_p = .06).

An analysis of simple effects showed that condition was significant (F (2, 112) = 137.06, p < .001) but the interaction between condition and school year for the French group was not (F < 1), while interaction was significant for the English group (F (2, 112) = 3.70, p < .05). This shows that there was a change in the pattern of performance between the two Grades for the English group.

In the lexical judgment task of Experiment 2, although the French children achieved higher scores than the English children (English: mean=75.19%, SD=15.55; French: mean=83.67%, SD=9.72) performance between the two groups proved to be non-significant (t (28) =1.79, p<.08). However, one sample t-tests revealed significant within-subjects performance (English: t (14) =6.27, p<.001; French: t (14) =13.41, p<.001).

In the lexical production task, both groups scored lower than in the judgment tasks, with the English group performing below chance (English: mean=39.33%, SD=10.33; French: mean=73.77%, SD=18.39). This difference between the two groups' performance turned out to be statistically significant in an independent samples t-test (t (28) =6.24, p<.001). In the non-lexical production task, where the children were tested on word and non-word roots, performance dropped even lower for both groups (English: word root, mean=22% SD=16.56, non-word root, mean=23.33% SD=13.45; French: word root, mean=48.67% SD=21.34, non-word root, mean=26% SD=16.39). A 2 (language) by 2 (condition) mixed ANOVA revealed a significant main effect of language (F(1,28)=7.74, p<.05, η^2_p =.22) and

condition ($F(1,28)=9.89$, $p<.01$, $\eta^2_p =.26$), as well as a significant interaction between the two ($F(1,28)=12.51$, $p<.01$, $\eta^2_p =.31$). In addition, the French children performed significantly higher than the English children on word roots (F (1, 28) =30.90, $p<.001$) but not on non-word roots ($F < 1$).

The researchers also looked at differences in performance across the three conditions, i.e. the production of real words, non-words with word roots, and non-words with non-word roots. A 2 (language) by 2 (condition) mixed ANOVA revealed a significant interaction between language and condition (F (2, 56) =13.12, $p<.001$, $\eta^2_p =.32$), while there was a significant effect of condition for both groups (English: F (2, 56) =9.09, $p<.001$; French: F (2, 56) =54.77, $p<.001$). These results show that the French group produces accurate responses over a wider range of responses than the English group.

It was not possible to perform a direct comparison between the judgment and production tasks due to differences in responses: the judgment task requires a simple 'yes' or 'no' answer, while the production task a full response. However, it was possible to conclude that it was easier to apply relational knowledge in the judgment task. The French group did not present a large difference in its responses in the two tasks (an advantage of 3-10% for the judgment task) as opposed to the English group, which demonstrated an advantage of 35%-45% for the judgment task. One explanation could be that the production task requires higher levels of explicit knowledge. Thus, although the two groups presented similar levels of implicit knowledge, which is necessary for metalinguistic development, this does not necessarily

guarantee the emergence of equal levels of meta-awareness. Thus, the French group seems to be more competent in explicit processing.

Only the French group's shift to explicit morphological awareness in the first grade supports Carlisle's (1995) argument. Carlisle (1995) designed experimental tasks about distinguishing the different levels of metalinguistic awareness regarding derivational morphology and found that the shift from implicit to explicit knowledge took place during kindergarten and first-grade years. The children she tested already possessed excellent implicit skills and were going through the transition of performing explicit tasks. The French group was better at generalising knowledge in order to produce novel derivations from word roots. The English group's ability to generalise showed a very slow improvement during these first three years of schooling. However, the English speakers did unusually well in the manipulation of the highly productive suffix *–er*. Thus, the English group's ability to manipulate suffixes is present but much more limited than that of the French group.

The variation that the speakers' responses presented probably occurs from both the preschool years and each country's educational system. This is drawn by the fact that both groups already differed in explicit awareness when they entered school, and in development by the third year of schooling. Derivational morphology is more productive in French; consequently, preschool spontaneous speech in French contains a wider range of suffixes than in English. In formal education, the introduction of derivational morphology is encouraged by the Ministry of Education, whereas teachers

employ a specific focus on derivational relations and productions. On the contrary, English teachers start introducing morphology at the end of Grade 1, which becomes more intensive in Grades 3 and 4. Another possibility why French speakers are more advanced in their morphological processing might be because they are exposed to a larger variety of suffixes in their reading materials from Grade 1. Seeing words in print helps to consolidate knowledge between meaning and form, while it also enhances the ability to apply this knowledge to novel settings. The results suggest that metamorphological development is accelerated in French relative to English. Part of the explanation for the French advantage encompasses knowledge of a broader range of suffixes and a markedly greater facility for generalizing morphological knowledge to novel contexts.

Nunes et al. (2006) also provide evidence that literacy affects learners' knowledge of morphemes. It is possible for children to be learning morphology while learning how to read and write due to the fact that the structure of words in English is dependent on their morphological activity. In their past studies, the researchers found evidence of a uni-directional relation (see Nunes et al. 1997 and Nunes et al. 2003), where children that were instructed showed greater spelling awareness in the post-test than children who were not. Thus, morphological awareness contributed to better spelling skills. The researchers argue that there is a bi-directional relation between morphemic knowledge and learning how to read and write, as previous studies have supported about phonological awareness and literacy (see e.g. Morais et al. 1979, 1986; Read et al. 1986). In other words, literacy also has

a positive impact on morphological awareness. Therefore, the researchers hypothesised that morphological awareness and literacy are mutually dependent because phonology does not adequately explain spelling rules. They predicted that children would develop morphological awareness as a consequence of learning how to read and write.

The researchers undertook two large-scale longitudinal studies. In the first study, the children's ability to represent morphology in their spelling was determined by the correct use of the regular past tense ending *-ed*, where they had to utter 37 words (10 regular past tense verbs, 10 irregulars and 10 non-verbs). This was followed by a sentence with the target word, repetition of the same word and, finally, writing it down (e.g. *lost: I lost my book at school: lost*). Morphological awareness was tested through two analogy tasks at the sentence and word level, where learners had to make associations between structures. In the oral tasks, puppets would say one sentence (e.g. *Tom helps Mary*) or one word (e.g. *walk*), then repeat the same sentence or word by having changed the tense of the verb (e.g. *Tom helped Mary* and *walked* respectively). Next, the first puppet said a second similar sentence or word and asked the child to play the role of the second puppet by making the same change in the sentence or the word.

The children came from four schools in Oxford (*n*=188) and London (*n*=175), and English was their native language. At the time of the first session, they were in years 2 (mean age 6;6), 3 (mean age 7;5), and 4 (mean age 8;6) in

school. The data originated from two sessions with Session A being the first and Session B the fourth in the project 12 months after.

The researchers controlled for extraneous variables of age and IQ to ensure statistical difference between spelling and morphological awareness. Results showed a steady improvement with growing age, from year 2 to year 4 a difference of: 3.57 in spelling in Session A; 2.25 and 1.47 in sentence analogy in Sessions A and B respectively; and 1.36 and 0.43 in word analogy in Sessions A and B respectively. There was also an improvement between sessions in sentence and word analogy: for year 2, an improvement of 1.72 and 1.48 from Session A to B; for year 3, an improvement of 1.46 and 0.78; and for year 4, an improvement of 0.94 and 0.55. A two-fixed order multiple regressions with children's spelling scores as predictor and the analogy tasks as outcome measures revealed significant regression equations in both morphology tasks except for age in the word analogy task in Session B (p = 0.18). In other words, children's success in spelling the inflection at the end of regular past verbs (e.g., *jumped* rather than *jumpt*) predicted their performance in two morphological awareness tasks a year later (e.g., ability to transform noun to adjectives, noun to verbs). Spelling turned out to be a positive predictor for children's morphological awareness.

In the second study, only the children from Oxford took part (n=152). The spelling task from the first study was used along with two more spelling tasks on consistency across words, and consistency between words and pseudo-words, whereas morphological awareness was tested through a pseudo-

word interpretation task. The two additional spelling tasks measured the ability to spell contextualised word and pseudo-word pairs (pictures with dinosaurs as stimuli), which contained the same stem in the base and the derived form (e.g. *know* - *knowledge* and *knot* - *knotosaurus*). The pseudo-word morphological awareness task was the final task (Session E) and it took place after seven months. The children had to explain meaning based on a real stem (e.g. *climb*) and affixes (e.g. *un-*) in a novel combination (e.g. *unclimb*). The purpose of these methodological changes was to examine external validity, whereas the use of pseudo-words with real morphemes aimed at testing children's capacity to perform morphological analysis in novel settings.

Results for study 2 showed a regular with age increase in the spelling task with the *-ed* ending but not in the two new spelling tasks regarding definitions. However, scores were inconsistent with respect to age, with students in year 3 scoring less than 1% lower than students in year 2, while students in year 3 scored slightly higher than the rest. The in-text definitions task, though, turned out significantly easier than the out-of-context task ($F(1, 147) = 42.72$, $p < .001$).

To ensure validity, Nunes et al. correlated the new measures with those developed earlier (Nunes et al. 1997). The spelling tasks correlated significantly with each other: the use of 'ed' task with the consistency across words and pseudo-words tasks ($r = .41$, $p < .001$ and $r = .55$, $p < .001$ respectively); the consistency across words with the consistency with

pseudo-words task (r = .66, p < .001). Additionally, a fixed-order three-step multiple regressions analysis revealed that the children's consistency in spelling morphemes predicted their ability to define new words based on their morphemic structure (use of 'ed': R^2 = .03, p = .047; consistency with pseudo-words: R^2 = .05, p = .006). These findings reinforce the external validity of the first study, as well as the argument that the spelling of many words depends on their morphemic structure. Therefore, children have to have some knowledge about morphemes in order to learn to read and write and vice versa, since this study confirms that learning to spell contributes to morphological awareness. As such, children gain much of their explicit knowledge about morphemes as a direct result of learning to read and to spell.

Scholes and Willis (1987) wished to discover any skills that might discriminate any factors related to age in language acquisition from those related to the development of the reading skill. Put simply, their aim was to produce new findings in order to differentiate language acquisition of readers versus non-readers. To achieve that, they administered a number of tasks testing the metalinguistic abilities of 30 children, who were good (n=10), poor (n=10) and average readers (n=10), and of adults who were illiterate (AI). The good readers were third graders (3G, mean age 8;2 years), the poor readers were also third graders (3P, mean age 8;7 years), and the average readers were fifth graders (5A, mean age 10;4 years). Their teacher provided their reading abilities. Half of the adult illiterates had been to school for a maximum of four years (n=6, mean age 44 years), while the other half had at

least eight years of schooling (*n*=6, mean age 40 years). Surprisingly, none of the adults possessed the ability to read; the researchers argued that those with more than 8 years of schooling might be 'reading impaired', i.e. to have some form of learning disability, while those with less than 4 years of schooling might be 'reading impoverished'. All participants were monolingual native speakers of English.

The testing battery consisted of one alphabet task, two phonology and two morphology tasks, and one auditory syntax comprehension task. Participants were tested on familiar (e.g. *take*), unfamiliar (e.g. *cannery*) and nonsense words (e.g. *mub*); on regular (e.g. *drink* < *drinkable*) and irregular inflections (e.g. *eat* < *edible*); and on easy (e.g. *what does a man-eating lion eat?*), moderately difficult (e.g. *what does a lion-chasing tiger chase?*), and difficult sentences (e.g. *if a young man who is following an old lady talking to a neighbor carrying a child rides a bicycle, who rides the bicycle?*). Participants were asked to recite the alphabet, to judge pairs of words as being the same or different (Phonology 1, e.g. *cake-take* vs. *prize-prize*), to delete phonemes (Phonology 2, e.g. *what word do you get if you take the [f] sound away from "fly"?*), to supply the inflected form of a contextualised word (Morphology 1, e.g. *Someone who works is a worker, and someone who writes is a ___?*), to analyse words into their component morphemes (Morphology 2, e.g. *stopwatch, rewriting, construction*), and to answer questions related to syntactic comprehension (e.g. *If it's Mary who is pushed by John, who does the pushing?*). The authors hypothesised that the testing battery might also

contribute to distinguishing between those who are reading impaired and those who are reading impoverished.

Contrary to the child groups, the adults were unable to successfully recite the alphabet with the exception of two individuals. The AI groups had similar scores in each phonology task, while they found Phonology 2 more challenging (Group with 4 or less years of schooling: 2.6 out of 3 in Phonology 1 and 0.0 in Phonology 2; Group with 8 or more years of schooling: 2.8 in Phonology 1 and 0.3 in Phonology 2). Overall, the two groups had lower scores in the morphology tasks (Group with 4 or less years of schooling: 0.7 out of 3 in Morphology 1 and 0.5 in Morphology 2; Group with 8 or more years of schooling: 1.2 in Morphology 1 and 1 in Morphology 2), while they found Morphology 2 the most difficult of all four tasks. It is worth noting that the group with the 8 or more years of schooling achieved higher scores than the other group.

According to the results, performance on the syntactic comprehension tasks depended on reading skills. The 5A and the 3G groups had the highest mean percentages of correct responses (73% and 69% respectively), followed by the 3P (64%) and the AI group (61%). All groups had the highest scores in Simple Active, conjunction and contiguous subjects + verb structures (90-100%). Performance dropped especially for the AI group in the following structures: disjunctions (AI: 63%; 3P: 90%; 3G: 70%; 5A: 70%); reversible passives (AI: 54%; 3P: 75%; 3G: 100%; 5A: 75%); subject-(clause)-verb (AI: 53%; 3P: 40%; 3G: 60%; 5A: 65%), discontiguous subject+verb (AI: 33%;

3P: 40%; 3G: 60%; 5A: 60%); and Object-verb-subject nominal (AI: 61%; 3P: 64%; 3G: 69%; 5A: 73%).

Overall, in none of the six tasks did the AI group perform significantly better than the 3P child group. The performance of the two AI groups is similar, with none of the adult illiterate participants being able to do phoneme deletion and to create new words by using inflections. In addition, the 3G child group did better than the 3P child group and the AI adult group but similarly to the 5A child group. In other words, reading skills make more of a difference than age because the good reader groups (3G and 5A) did better than the poor readers and the illiterates, while the 3G and 5A groups had similar performance despite the fact that they differed in age. Therefore, education made more of a difference than age in language acquisition.

Group comparisons revealed three main findings. Firstly, non-readers present the same analytical linguistic abilities regardless of age. Secondly, those who know how to read obtain the ability to analyse words phonologically and morphologically during the first years of reading experience. Finally, this follow-up study confirmed findings of previous studies, in which skills concerning syntax seem to be associated more with reading experience rather than cognitive maturation that comes with age.

Studies have also compared reading experience to age and found that the former plays a more important role in language acquisition. Dellatolas et al. (2003) compared speakers of different age groups and of different literacy

levels. The study examined how the level of illiteracy affected the neuropsychological performance both of adults and of children on a variety of tasks. The testing battery included oral language tasks with repetition of words and non-words (e.g. short mono- and bi-syllabic words *porta* 'door' and *flor* 'rose'; short mono- and bi-syllabic non-words *log, belu, zal)*, and visual tasks (e.g. retention of nonsense figures and counting dots). Children readers outperformed children non-readers on speech segmentation and initial phoneme deletion with cluster onset (consonant-consonant-vowel, e.g. ***p****rato/rato*). However, all groups' scores dropped when the participants were asked to repeat long non-words (e.g. *tocapebo, veliguri*), as opposed to long words (e.g. *passarinho* 'canary', bicicleta 'bicycle') or short non-words (*dongue, suda)*, where literates outperformed the illiterates. This suggests that, by learning how to read, readers are trained on how to automatically combine graphemes in order to create syllables and produce words regardless of whether they are meaningful or not. Indeed, the language processing PET scan showed that the literates' brain activity both for words and for non-words was the same, which is an indication that literacy contributes to a more automatic processing of non-word repetition.

Overall, there are numerous studies showing a strong relationship between literacy and metalinguistic awareness, particularly in alphabetic languages. There is considerable evidence that phonemic awareness is a consequence of acquiring an alphabetic writing system. Illiterates and pre-literates have been shown to do very poorly on phonemic segmentation tasks, such as adding or deleting a single consonant at the beginning of a word, or naming

words beginning with the same consonant. However, they do not seem to have any problems with phonological tasks involving larger units, such as syllables or rhymes (Adrián et al. 1995; Kolinsky et al. 1987; Morais et al. 1979, 1986; Read et al. 1986). As already shown in Dellatolas et al. (2003), being literate is also related to skills that have to do with the manipulation of artificial words, with illiterates facing difficulties in repeating pseudowords, which they often substitute with real words. The researchers also found that literates and illiterates have different patterns of brain activation when repeating pseudowords, although, interestingly, not when repeating real words. Castro-Caldas et al. (1998) and Reis and Castro-Caldas (1997) produced similar findings with adult illiterate speakers. In the next section, I will address the findings of these studies with respect to L1 development in adult illiterates.

2.4.2 Oral Processing and Adult Literacy

Morais et al.'s (1979) study was one of the first studies to support that literacy has an effect on oral language processing with respect to linguistic segmentation at the phonemic level by studying L1 Portuguese. In other words, they provided evidence that awareness of speech as a sequence of phonemes is not a result of cognitive maturation. Instead, it occurs from training on how to read and write alphabetically. For this reason, illiterate and literate participants' awareness was measured through one task of phoneme addition (e.g. *alhaço* became ***p****alhaço* 'clown') and one task of phoneme deletion (e.g. ***p****urso* became *urso* 'bear') at the beginning of an utterance containing both words and non-words. The researchers focused on the

production of three specific consonants belonging in the groups of plosives [p], fricatives [ʃ] and nasals [m].

Overall results showed that word trials yielded better performance than non-word trials, while the literate group outperformed the illiterate group in non-word trials in both tasks. More specifically, the illiterate participants were unable to add or delete phonemes at the beginning of non-words (mean of correct responses 19%), while the relatively literate participants faced minor difficulties (mean of correct responses 72%). Within the illiterate group, there was a significant difference between those who had received some schooling or were taught the names of letters (30%) and those who had not (13%) on non-word trials ($t=1.696; df=28, p<0.05$). Finally, no significant difference was found between the literate participants who learned to read before and after the age of 25 (75% and 71% respectively; $t=0.384; df=28$).

These results agree with Dellatolas et al.'s (2003) findings where 75% of the reader group named letters correctly with the remaining 25% making one or two errors. On the contrary, only 30.9% of the non-reader group could name letters. In addition, the reader group showed a stronger performance on phonological fluency and initial phoneme deletion tasks than on the other tasks. These two tasks were significantly related to letter knowledge with respect to the non-reader group (phonological fluency: Pearson $r=0.44, p=0.00;$ Spearman $R=0.49, p=0.00;$ initial phoneme deletion: Pearson $r=0.33, p=0.00;$ Spearman $R=0.34, p=0.00)$. These results clearly indicate

that literacy acquisition raises awareness of the phonemic structures of language regardless the age of onset.

In a follow-up study, Morais et al. (1986) tested new groups of illiterate and ex-illiterate adults (further divided to poorer and better readers) on a number of additional tasks (see Appendix A, Table A1). The researchers replicated the main finding of their previous study. Illiterate adults were unable to delete a consonant at the beginning of an utterance (mean of correct responses for word trials 26%; mean of correct responses for non-word trials 19%), as opposed to the ex-illiterate adults (mean of correct responses for word trials 87%; mean of correct responses for non-word trials 73%).

However, illiterates were significantly better at performing syllabic than sub-syllabic segmentation (*p<0.00)*. Only two illiterate participants managed to produce one phoneme, while 9 out of 21 reached syllabic segmentation in the 'progressive segmentation of speech' task (24.8%). Within the ex-illiterate group, better readers significantly outperformed poorer readers on initial consonant deletion (*t=2.56, df=18, p<0.01*), while there were no significant differences on syllabic vowel deletion. Thus, contrary to phonetic-level analysis, which is strongly dependent on formal reading instruction, syllabic-level analysis does not require the capacities gained by the experience of learning to read. However, given that illiterates had a lower overall performance than ex-illiterates, it can be argued that reading instruction provides substantial improvement to syllabic-level analysis of speech.

The aforementioned studies were conducted in Brazil and did not take into account the potential differences that might occur among the groups with relation to their backgrounds. Consequently, it is not certain whether literacy was the only factor contributing to their results or whether other factors, such as local culture, home environment, and school experience, accounted for the differences found in language processing. However, Read et al. (1986) managed to address this issue by recruiting two groups of literate Chinese speakers who differed primarily in age. Instead of testing literates and non-literates, Read et al. tested alphabetic and non-alphabetic literates in order to study the specific effect of alphabetic literacy in speech manipulation. This comparison was possible in China due to a change in the educational system, where adults who completed primary school before 1958 were never exposed to alphabetic writing. By contrast, people younger than 35 years old at the time were taught the alphabetic representation of their language in primary school before being exposed to the Chinese characters.

One group was literate only in Chinese characters (non-alphabetic group), while the other group was literate in both Chinese characters and alphabetic script (alphabetic group). The test battery was similar to that of Morais et al. (1979). Adding or deleting initial consonants is considered relatively easy in Chinese because every syllable has one initial consonant or none. Participants were tested in both words and non-words, and in three specific phonemes: */d/, /s/,* and */n/*. Thus, they were exposed to six conditions. After training, the researcher would read each stimulus and wait for the

participant's response. Findings confirm those of Morais et al., where the non-alphabetic group could not add nor delete phonemes at the beginning of non-words (mean of correct responses 21%), while in Read et al.'s study this large difference was also noticed with real words (mean of correct responses 37%). The alphabetic group outperformed the non-alphabetic group by 62% on non-words and by 56% on real words. Mean scores were significantly different by alphabetic literacy (*F(1, 28)=55.75, p<0.00)* and by word versus non-word target (*F(1, 28)=7.64, p<0.01)* (Read et al., 1986: 38). Results of both studies were similar with regard to error analysis, i.e. participants tended to replace non-words with real words. Read et al. (1986: 42-43) pointed out the following:

> 'Learning to read and write alphabetically requires conceiving of speech as a sequence of phonemes and skill in locating and identifying phonemes within syllables. Morais et al. (1979: 42-43) showed that that skill does not develop spontaneously. We can now add that it does not develop even with 7 years of schooling and 40 years of reading and writing nonalphabetically in a language rich in implicit examples like rhymes, minimal pairs, and phonetic radicals, not to mention Spoonerisms.'

To summarise, not only did Read et al. (1986) confirm the findings of Morais et al.'s (1979) study but they also managed to narrow them down by concluding that alphabetic literacy specifically leads to the acquisition of the segmentation skill. Even though some of the alphabetically literate participants had lost a substantial part of their reading skill, they were still able to segment phonemes indicating that, once gained, the concept of speech segmentation does not disappear.

Kolinsky et al. (1987) focussed on the oral processing of words rather than phonemes and found out that awareness of the phonological length of words does not exclusively depend on the skill of reading. However, it does relate to literacy, as the experience of language on its own is not enough for someone to perceive the metalinguistic nature of words. Thus, their study concerned the ability to reflect on words as objects and, specifically, to examine comprehension of phonological length in illiterate adults. The researchers tested 21 illiterate adults and 20 former illiterate adults in L1 Portuguese. The former illiterate adults started learning to read during adulthood. The study consisted of two experiments. Experiment 1 included a production task of long and short words and version 1 of a matching task, where participants had to match the oral and the written form of a long and a short word. Experiment 2 included the same production task and version 2 of the matching task, where participants were asked to choose between two pictures the one with the longest name. Both groups were tested in the production of their own short and long words, while only the illiterate group was tested in the matching tasks.

The matching task of Experiment 2 consisted of three different conditions: in the *neutral* condition, the phonological word length varied while the physical size of the objects remained the same (e.g. *pato* – *galinha* ‘duck – chicken’). In the *congruent* condition, phonological length and physical size coincided (e.g. *camelo* – *olho* ‘camel – eye’). Finally, smaller objects with longer names were chosen for the *incongruent* condition (e.g. *casa* – *televisão* ‘house – television’). These three conditions make the matching task more reliable in

figuring the ability of focusing on phonological length only without the influence of the word's semantic properties. There are several reasons for the rationale behind the two versions of the matching task. Firstly, there are no written words in version 2 to influence the participants' answers. Secondly, the researcher does not read the words aloud, so participants are not exposed to any acoustic cues. Thirdly, participants need not identify which the referent is in version 1 as in version 2, where there are pictures of the objects.

In the production task, the experimenter asked the participants to produce examples of short and long words with justifications. In the matching task of experiment 1, participants had to match the oral and the written form of short and long words (e.g. 'one of these words is X, the other is Y. Which one is X?) (Kolinsky et al. 1987: 224). In the matching task of experiment 2, participants were given 42 pairs of drawings with short and long names and the researcher would ask them to point out the drawing with the longer name without providing any information.

In Experiment 1, 80% of the illiterate participants was unable to produce responses consistent with the instructions, whereas 30% was unable to produce correct responses due to lack of metalinguistic knowledge of the concept 'word'. For instance, one participant gave the sentence '*Gostava de saber le'* (=I'd like to be able to read) as an example of a long word and '*Gostava'* (=I'd like) as an example of a short word (Kolinsky et al. 1987: 225). Thus, illiterates responded with phrases when asked to provide long

words. The main source of errors during the production task was mistaking a word for ‘long’ or ‘short’ due to the object’s physical size (e.g. long word: *nogueira* ‘walnut tree’ because it is a big tree; short word: *galinha* ‘chicken’ because it is smaller) (Kolinsky et al. 1987: 226). Semantics seemed to be the most appealing factor for lexical processing in illiterates.

With regard to the matching task of Experiment 1, 93.7% of the time participants were correct in the congruent condition, i.e. when phonological and semantic properties coincided, as opposed to the 47.4% in the incongruent condition. Even though there was an overlap between phonology and meaning half of the time, some of the participants provided an explanation (e.g., *aviao* was indicated to contain more letters than *gafanhoto*; *carruagem* ‘carriage’ is the longest word because “it has more space”) (Kolinsky et al. 1987: 226). The researchers made two conclusions: firstly, literacy is not essential in creating a link between what is being said and what is written, given that almost half of the illiterate adults could make correlations of length between spoken and written words. Secondly, this does not mean, however, that the literate surrounding environment is sufficient in order to disregard a possible link between semantics and morphology due to lack of formal reading instruction. Instruction raises awareness in the metalinguistic properties of the language.

Despite the above chance performance in the neutral condition, participants were still influenced by meaning in Experiment 2 ($t\ (9) = 5.6,\ p < 0.00$). More specifically, analysis showed an effect of condition ($F\ (2,18) = 16.96,\ p < 0.00$).

There was an interference effect when comparing neutral and incongruent conditions (*F (1-9) =19.92, p<0.00)*, while there was a facilitation effect between neutral and congruent conditions (*F (1-9) =10.07, p<0.02).* Individual differences also played an important role. In the neutral condition, four participants had a mediocre performance (50-70% correct responses), whereas three others performed at ceiling (80-90% correct responses). Analysis showed that the effect of interference was stronger for those who performed poorer in the neutral condition (*r=0.87, p<0.00)*. Therefore, the results of Experiment 2 confirm those of Experiment 1 in that illiterate adults cannot ignore semantic content. Despite the fact that half of the illiterate participants were able to provide correct responses, the other half did not manage to ignore semantic information and rely entirely on phonology. These findings show that literacy 'elicits awareness of words as phonological entities' (Kolinsky et al. 1987: 230) without it being the only prerequisite for raising such awareness, especially since the ex-illiterates produced accurate responses.

Adrián et al. (1995) compared the metaphonological abilities of Spanish illiterate L1 adults to those of rudimentary readers. The aim of this study was two-fold: first, to identify whether illiterate adults were able to discriminate between minimally different phonetic pairs. This refers to phonological sensitivity, which is to be separated from phonological awareness. Phonological sensitivity is the ability to deal with phonological properties of speech, such as being able to tell the difference in the Spanish words "bala", "pala", and "gala", while phonological awareness refers to the speaker's

ability to explain decisions based on the phonological properties of words by using metalinguistic explanations. Thus, phonological sensitivity is part of phonological awareness.

Phonemic awareness is also to be separated by the previous two terms, since it refers to the ability to consciously separate the smallest unit in speech, phonemes, as unique entities. Illiterates possess some knowledge of phonological awareness. However, previous studies have shown that illiterate adults lack in phonemic awareness, supporting the argument that phonemic awareness depends on the reading and writing skills in an alphabetic script. The researchers' second aim was to distinguish between the different meta-phonological abilities of illiterates, i.e. to compare conscious access to different phonological units, such as words, syllables and phonemes.

To achieve the above, the researchers employed an extensive testing battery consisting of discrimination, detection, deletion, and reversal tasks at the word, syllable, and phonemic level of both words and pseudowords. The discrimination task asked whether consonant-vowel pairs (e.g. /me-me/ or /ta-sa/) differed or not. The detection task tested all three levels (word, syllable, and phoneme) on both words and pseudowords. Participants were asked whether pairs rhymed (rhyme detection, e.g. [ʼmepu-ʼpepu]), whether they had an identical syllable (matching task-syllable detection, e.g. [ʼxakɔ-ʼxade/], and whether they had an identical phoneme (matching task-phoneme detection, e.g. [til-sun]).

The participants' ability on detection was also monitored by asking whether the target syllable was contained in the two-syllable pseudoword that followed (monitoring task-syllable detection, e.g. 'Is [pa] contained in ['pati]?), and whether the target phoneme was in the one-syllable pseudo-word that followed (monitoring task-phoneme detection, e.g. 'Is [pə] contained in [pal]?). The two-level (syllable-phoneme) deletion task tested whether participants were able to repeat pseudowords after the deletion of the consonant-vowel target syllable (syllable deletion, e.g. 'If we subtract [de] from the word ['kade], then we have…?') and after the deletion of the target phonemes (phoneme deletion, e.g. 'if we subtract [tə] from the syllable [tɔl] then we have…?').

Finally, the three-level reversal task moved from larger (word) to smaller units (syllable, phoneme) by asking the participants to do the following: to repeat pairs of words in inverse order (word reversal, e.g. Q: 'How would you say 'zanahoria rota' (broken carrot) backwards?' Ans: [rota zanahoria]), to repeat words in reverse order (syllable reversal, e.g. Q: 'how would you say 'mesa' (table) backwards?' Ans: [same]), and to repeat syllables in inverse order (phoneme reversal, e.g. Q: 'How would you say [pa] backwards?' Ans: [ap]). Their participants consisted of 15 illiterate adults (mean age 46) and 32 rudimentary readers, half of whom were assigned to a group of poorer readers (mean age 53) and the other half to a group of better readers (mean age 43). Their reading abilities were determined through a reading task.

Results showed that illiterates were able to discriminate whether pairs of syllables differed or not. They obtained very high scores in identifying the phonological properties of words (mean percentage 96.2%, SD=5.3), while the ANOVA analysis did not reveal any statistical differences between groups (F (2.44) < 1). However, the illiterates' scores were very low in the matching (syllable mean percentage 70.2, SD=10.6; phoneme mean percentage 68.4, SD=13.8), monitoring (syllable mean percentage 83.4, SD=18.7; phoneme mean percentage 64.1, SD=25.1), deletion (syllable mean percentage 20.7, SD=21.3; phoneme mean percentage 12, SD=14) and reversal of phonemes (word mean percentage 68.8, SD=38.7; syllable mean percentage 9.6, SD=21.3; phoneme mean percentage 1.3%, SD=2.7), where conscious awareness is necessary for phoneme manipulation.

For the detection task, the ANOVA analysis revealed main effects of group (F (2, 44) = 27.45, p < 0.001), type of task (matching vs. monitoring, F (1, 44) = 8.43, p < 0.006), and unit (syllable vs. phoneme, F (1, 44) = 10.07, p < 0.003), while there was no interaction between group and task (F (2, 44) < 1). Unit interacted with both group (F (2, 44) = 5.64, p < 0.007) and task (F (1, 44) = 24.42, p < 0.001). In the matching and monitoring tasks, the illiterate group was found to differ significantly from the poorer (matching: F (2, 29) = 25.98, p < 0.05; monitoring: F (2, 29) = 7.90, p < 0.05) and the better readers (matching: F (2, 29) = 28.65, p < 0.05; monitoring: F (2,29) = 11.54, p < 0.05), who did not differ from one another. For the deletion task, the ANOVA analysis revealed significant effects of unit (F(1, 44) = 6.11, p < 0.017) and group (F(2, 44) = 96.00, p < 0.001) without a significant

interaction ($F(2, 44) < 1$), while differences between groups were significant (illiterates vs. poorer readers: $F(2, 29) = 40.74$, $p < 0.05$; illiterates vs. better readers: $F(2, 29) = 93.31$, $p < 0.05$; and poorer readers vs. better readers: $F(2, 30) = 11.10$, $p < 0.05$).

Finally, for the reversal task, the ANOVA analysis revealed significant effects of group for word (F (2, 44) = 9.23, $p < 0.001$), syllable (F (2, 44) = 48.49, $p < 0.001$), and phoneme reversal (F (2, 44) = 57.27, $p < 0.001$). All groups differed significantly in syllable (illiterates vs. poorer readers: $F(2, 29) = 11.21$, $p < 0.05$; illiterates vs. better readers: $F(2, 29) = 48.41$, $p < 0.05$; and poorer readers vs. better readers: $F(2, 30) = 13.46$, $p < 0.05$) and phoneme reversal (illiterates vs. poorer readers: $F(2, 29) = 9.97$, $p < 0.05$; illiterates vs. better readers: $F(2, 29) = 56.56$, $p < 0.05$; and poorer readers vs. better readers: $F(2, 30) = 19.68$, $p < 0.05$). However, only the illiterate group differed significantly from the other two groups in the word reversal condition (illiterates vs. poorer readers: F (2, 29) = 7.47, $p < 0.05$; and illiterates vs. better readers: F (2, 29) = 6.5, $p < 0.05$). The fact that the illiterate participants achieved such high scores in the discrimination task and such low scores in the phonemic awareness tasks supports the researchers' argument for the need to separate phonological sensitivity from phonemic awareness, and it also shows that phonological sensitivity does not depend on knowledge of the alphabet as opposed to phonemic awareness.

These results support previous data regarding illiterate speakers' lack of phonemic awareness (see e.g. Kolinsky et al. 1987; Morais et al. 1979, 1986;

Read et al. 1986), and are among the lowest of all. According to the researchers, one explanation could be that the number of trials in the present study (20 trials) was lower than in previous studies, probably leading to task changes that were too quick for the illiterate group. This argument is supported by Morais et al.'s (1988) finding that illiterates started to respond correctly in their deletion task after 20 or 30 trials. The researchers' second aim was to compare conscious awareness of the different phonological units, and these results show that rhyme and syllable manipulation are easier than phoneme manipulation. This is evident both from the illiterates' low scores and from the significant differences found between the performance of the illiterates and the poor readers, while there was no overlapping in phonemic tasks. This enhances the argument that metaphonological awareness at the phonemic level is dependent on the knowledge of the alphabetic writing system.

In a more recent study, Reis et al. (2007) also looked at the extent that illiterate adults focus on form rather than meaning through a phonological task. Contrary to the previous studies, where participants were tested through written or visual stimuli, Reis et al. tested their participants with auditory stimuli. They predicted that the illiterate group's performance would be lower than the literate group's in the incongruent word condition, i.e. when phonological and semantic properties clash. In addition, the researchers also discuss the issue of whether illiterates will be able to assess phonological length without any written or visual representations, especially in the case of pseudo-words where meaning is absent. Thus, their aim was to find out

whether literacy has an effect on words as phonological entities regardless of semantics.

Twenty-two illiterate and 22 literate participants were tested through two sets of 15 word pairs each (e.g. *malmequer* – *rosa* 'marigold – rose') and two sets of 15 pseudo-word pairs (e.g. *puda* – *caspilha*). Each participant was given one list with one word set and one list with one pseudo-word set in a randomised order. Only the word-pair condition was divided into three sub-conditions as in previous studies: congruent, incongruent, and neutral (see Kolinsky et al. 1987; Reis and Castro-Caldas 1997). The participants' task was to decide which item in each pair was the longer phonologically (Reis et al. 2007: 71).

Results showed large effect sizes in all conditions in the group comparisons with Cohen's *d* ranging from 0.9 to 2.2 except for the congruent word condition with a medium effect size (d = 0.7), where form and meaning agree. Literates outperformed illiterates significantly in both words and pseudo-words ($p<0.00$). With respect to the incongruent condition, which holds the most semantic interference, literates significantly outperformed illiterates as expected ($p<0.00$). Within the illiterate group, participants performed significantly better ($p=0.03$) in the congruent word condition (94%) than in the pseudo-word condition (86%), while they performed significantly better in the pseudo-word condition than in the incongruent (52%) and neutral (72%) word conditions ($p<0.00$ and $p=0.02$ respectively).

This interesting finding leads the researchers to believe that illiterates are still able to process phonological word length even in the absence of meaning. On the other hand, the literate group outperformed the illiterate group in the pseudo-word condition, which supports previous findings this time through auditory stimuli and by adding pseudo-words. Therefore, the researchers' prediction that lack of literacy leads to a different perception of words as entities was supported by the findings and this difference to literates undoubtedly affects phonological performance.

All of the above studies on adult literacy show the difficulties that adults learning to read for the first time in adulthood come across. There is still need to study other aspects of L1A with respect to literacy, such as syntax and morphology (Tarone et al., 2009). The current findings are also invaluable for learners who acquire the alphabetic script for the first time in the L2 or for learners with low L1 literacy who acquire the L2 oral skills without any schooling. In the next section, I will discuss the research conducted in L2 acquisition and development with respect to literacy.

2.5 Conclusion

The findings of the studies conducted so far with underprivileged communities emphasise the value of research conducted with participants in various naturalistic settings, as well as the impact of literacy on the cognitive processes of the illiterate population. It is imperative for SLA researchers to carry out studies with adult L2 learners that have received little or no schooling in the L1. Claims that findings are representative of and applicable

to the wider population cannot be made, unless more studies with L2 learners that do not belong in the middle-class highly educated society take place. The existing number of studies is not sufficient to represent the whole population, either because each context is unique, or because all syntactic, pragmatic, and morphological aspects of language need to be studied. There is also need to focus on the effect that the L1 educational background has on the processing strategies of the L2 oral skills; the latter are the first and probably the only means of communication for some of these learners.

The concept that learners need to notice language in order to acquire it has been on the spotlight since the 1990s and makes an inherent part of SLA theory. However, Tarone et al. (2009) is one of the very few studies that have addressed the notion of noticing by testing the *Noticing hypothesis* on the illiterate population. My study will contribute to the testing both of these hypotheses and of this population with additional findings. What follows next, in Chapter 3, is an introduction to Schmidt's (1990, 2001) *Noticing hypothesis*, along with a discussion of other key concepts around the acquisition of L2 oral skills.

Chapter 3 – Theoretical Implications for SLA

3.1 Introduction

Literacy has a potential effect on the L2 learners' ability to notice the difference of the linguistic form between the input they receive and their own output (Bigelow and Tarone 2004). Benefits, such as conscious awareness of grammatical rules and metalanguage, originate from literacy-related skills. Tarone et al. (2009) tested Schmidt's (1990) *Noticing hypothesis* with regard to question formation and morpho-syntactic features of L2 English, such as grammatical morphemes (e.g. the plural marker *–s* and the progressive *–ing*). Their findings showed that low literate adult L2 learners' oral language consisted of simpler structures than that of their relatively literate counterparts (e.g. production of verbs without inflection and lack of subject-verb inversion in question formation). However, there is lack of empirical evidence on the comparison of noticing of L2 morphology by older literate and less literate L2 learners (Bigelow and Tarone 2004).

This chapter focuses on the theoretical implications of the level of L1 literacy on the acquisition of the oral skills of the L2 and specifically on how the former influences conscious attention to form. I discuss literacy with respect to Schmidt's (1990, 2001) *Noticing hypothesis* and Ellis' (2008, 2017) theory behind language learners' *selective attention*. I also discuss how Krashen's (1982) *Monitor model* could be reconsidered based on the study of the illiterate population. Finally, I present the potential implication of reporting literacy levels with respect to Clahsen and colleagues' studies on the *ZISA*

projects regarding the developmental stages of individuals with different self-reported levels of education.

3.2 Noticing and Level of Literacy

Schmidt (1990) developed the *Noticing hypothesis* as a result of his personal experience of learning Brazilian Portuguese. Specifically, Schmidt spent five months learning Portuguese in Brazil. He took part in a five-week course, while he relied on everyday interaction to learn the language for the remainder of his stay. Schmidt and Frota (1986) investigated 21 verbal constructions, out of which 14 had been taught explicitly. Data came from a variety of sources: Schmidt's personal journal, monthly tape recordings of interactions with native speakers, Schmidt's subjective notes, class notes and texts, and the interlocutor's recorded speech as sample of input.

With respect to instruction, the researchers noticed that not all taught constructions were used in the learner's output. However, they also reported that the language features that Schmidt noticed in conversational interaction with native speakers were the ones that he was taught in the classroom, suggesting that formal instruction contributed to increasing the clarity of target forms noticed in input. Schmidt noticed these forms after instruction had raised his awareness of their existence (Schmidt 1993).

With respect to native speaker input, results showed that Schmidt had been using a striking amount of input from the interactions in his own speech. Frequency of the target items in interactions made a difference in production.

The more a construction appeared in the native speaker's input, the more possibilities there were for the learner to produce that construction, while forms that did not appear in the input never appeared in the output. However, there were also forms that appeared in the input but not in the learner's output; thus, appearance and frequency were not the only factors that mattered.

A comparison with the journal notes supported these findings, as Schmidt had taken notes of the forms he had noticed and eventually produced. Interestingly, Schmidt also noticed forms that were not taught in the classroom. So, some of the constructions that he noticed during the interactions were not part of the instruction that he received. Schmidt attributed his noticing of these unknown linguistic elements to the fact that they hindered comprehension, i.e. incomprehensible input during natural interaction drew his attention to untaught forms (Schmidt 1993).

This study produces evidence of the relationship between noticing and output. However, it also shows that noticing is neither sufficient for learning nor essential for internalising language. For instance, the learner was recorded repeating a form produced by the native speaker without using it ever again. Alternatively, in the case of the conditional, the learner consistently used it in his own speech without ever mentioning it in his journal. This brings the issue of memory constraints during natural interaction, where it is not possible in retrospect to keep a record of

everything noticed. Thus, lack of record does not mean that something was not noticed or that it was not logged in the learner's awareness.

In his hypothesis, Schmidt defines 'noticing' as the ability to verbalise that which is being learned (Schmidt 1990). Lack of verbal report, however, does not entail lack of noticing unless it takes place at the same time as learning or straight after the learning experience. At the same time, Schmidt does not degrade the existence or importance of unconscious processes, where a native speaker or a fluent L2 learner becomes aware of the meaning of a text without being able to report the complex aspects of the language. In order to be able to verbalise, the learner needs to be aware of the learning that takes place, as well as the type of learning that takes place. This need for awareness introduced the notions of 'conscious' and 'unconscious' learning.

'Conscious' or 'intentional learning' refers to the intention to learn (Schmidt 1993). Thus, the learner is aware of the learning that takes place. On the other hand, 'unconscious' or 'incidental learning' refers to learning that takes place incidentally, which occurs as a by-product of doing something else. Learners are not aware of the learning of an additional element, while in the case that learners notice, they are not always able to explain it explicitly. When comparing the two types of learning, Hulstijn (1992) argues that incidental learners have a poorer performance than intentional learners in word meaning retention tasks (vocabulary retention). In his experiments of the incidental learning of L2 vocabulary under context, he found that L2 learners that are given the word meanings of a text that they only encounter

once are less likely to retain those word meanings than L2 learners who have inferred those meanings by themselves as a result of wishing to expand their L2 vocabulary. That is because intentional learning takes much more mental effort than incidental learning but also because of the learner's conscious effort and will.

In order to answer the question of whether L2 learning is conscious or unconscious, Schmidt (1990, 1993) argued that it is a matter of taking into account more than one factors. Is the learner aware of having learned something? Has the learner picked up language at the level of noticing? Is noticing automatic or must the learner consciously pay attention? Can rules be acquired without any conscious understanding taking place? Can learners verbalise what they notice? All of the above questions concern how learners process the input that they receive, since that is what consciousness is essentially linked to.

Overall, the illiterate population is assumed to be in a disadvantage due to lack of literacy-related skills, which are argued to enhance noticing. Thus, illiterate or low-literate learners are disadvantaged when compared to highly literate L2 learners who possess highly analytical skills (Tarone and Bigelow 2005). Research on L1 acquisition shows that illiterate learners have problems with segmental linguistic units (e.g. Dellatolas et al. 2003; Morais et al. 1979, 1986; Read et al. 1986), and it is assumed that the same thing happens with the oral input that learners receive in the L2. Evidence from the L2 studies shows that less literate learners are less able than more literate

learners to notice the differences between the linguistic forms in the L2 oral input and their own output (Bigelow and Tarone 2004: 693).

However, illiterates might use other mechanisms in order to remember given that they manage to acquire the L2 oral skills without any help. Before written registers appeared, knowledge was transferred through storytelling and reciting, while some societies' oral genres are comparable to the written genres of other societies (Fleisher Feldman 1991; in Bigelow and Tarone 2004: 693). One such instance of an illiterate population that managed to acquire their L2 fluently[1] without possessing any metalinguistic skills are the Somali adults in Tarone et al.'s (2009) study.

Tarone et al. (2009) conducted three interrelated studies to test Schmidt's (1990, 1994, 1995) *Noticing hypothesis*, who noticed that he implemented some forms in his everyday language after receiving instruction. Although these language forms were always available, he could only attend to them after instruction had raised his awareness. Thus, he concluded that a language learner could process input once it was noticed and that noticing turned input into intake (Schmidt 1990). As for adult L2 learners, he argued that attention of the L2 forms needs to be conscious. Noticing facilitates language learning or even functions as a necessity in adult L2 learners, who are cognitively mature and aware of language learning when in an instructional environment (Schmidt 1994, 1995). However, Schmidt's theory,

[1] The researchers reported: 'The speech production of all our participants appeared to us to be strikingly fluent and colloquial, and our interactions contained very few breakdowns in communication. The participants demonstrated strong pragmatic skills in their use of oral English, routinely initiating small talk with the adult researchers before and after doing the tasks.' (Tarone et al. 2009: 43)

similar to the majority of research, is based on alphabetically literate L2 learners. Tarone et al. (2009) tested the *Noticing hypothesis* on low-literate individuals by focusing on question formation and L2 English morphosyntax.

Two of the studies were on question formation through corrective feedback (study 1; see example 2).

3	ABUKAR	Ok, Where, they?	(Ungrammatical trigger)
	RESEARCHER	Where are they?	(Correction: recast)
	ABUKAR	Where are they?	(Accurate recall/uptake)

(Tarone et al. 2009: 57)

And elicited imitation and recall tasks (study 2; see examples 3 and 4 respectively).

4	RESEARCHER	Where do I buy the best donuts?
	NAJMA	Where I'm buying best donut?
	RESEARCHER	How do you get to the market?
	NAJMA	How you get in to market?
	RESEARCHER	When does he start work with David?
	NAJMA	What time he starting with, with David starting, with the ah work?
	RESEARCHER	What do they learn at the movies?
	NAJMA	What they lear, learn in the movie?

(Tarone et al. 2009: 81)

5	ABUKAR	What did she did? (initial utterance with errors, or 'trigger')
	RESEARCHER	What did she do? (recast)
	ABUKAR	What did she do? (recall)

(Tarone et al. 2009: 83)

In the third study, participants were tested on two grammatical phenomena: morphology and sentence complexity. More specifically, the third study looked at the presence or absence of specific morpho-syntactic features in

verbal (auxiliary *be*; progressive –*ing*; third person singular present tense –*s*; and past tense –*ed*; see example 5) and nominal (plural –*s*; see example 6) morphology.

6 FAADUMO (moderate literacy) Her mom *says*, 'Come in now, in a car.'
NAJMA (low literacy) Her mother they *say*, 'We going right now…'

(Tarone et al. 2009: 100)

7 UBAX (low literacy) *A lot of monkey*_ they take his hat_.
KHALID (moderate literacy) *The monkeys* took all his hats.

(Tarone et al. 2009: 102)

In sentence complexity, participants were tested on their ability to express causality by producing dependent clauses and clauses with 'so' through oral narrative tasks (study 3; see example 7).

8 (a) ABUKAR (low literacy) The guy can't talk to her *because* a man between her them them both of them.
(b) RESEARCHER How does he know it's not his suitcase?
NAJMA (low literacy) *Because* he just said the lady clothes.
(c) FAADUMO (moderate literacy) There's a man, he look at his suitcase but it's not his suitcase, but he switch when he <?> right? *So* he is frightened. *So* however he look, *so* someone taking his suitcase.

(Tarone et al. 2009: 103, 105)

The researchers' overall aim was to replicate Philp's (2003) study in order to observe whether previous findings were generalisable to the illiterate or low-literate population. Philp's study was on how highly educated learners process implicit negative feedback and was one of the very few studies that tested participants entirely in the oral modality. Tarone et al. (2009) specifically wished to explore how L1 alphabetic print literacy affected the L2 oral skills under the context of question formation and the use of semantically redundant grammatical morphemes.

The researchers point out the gap on the low-literate adult's processing of L2 acquisition and how assumptions are made based on findings of studies that involve highly educated adult L2 learners. For this purpose, they recruited 35 adolescent and adult participants from the community of Somali immigrants in Minnesota, USA. The participants' literacy level was measured through an adapted version of the Native Language Literacy Screening Device (NLLSD). This literacy measurement tool was not available in Somali; however, it was found suitable for the assessment of learners with very low literacy levels, where decoding skills are not taken for granted. Therefore, the researchers translated it into Somali and adapted it to the needs of their sample. Participants had to write down general demographic information, such as name and address; answer simple questions, such as place of birth and arrival in the USA; read silently short personal narratives and, finally, write their own personal narrative. During this time, the researcher, who took notes on the participants' behaviour, was observing them.

To assess oral L2 proficiency, the researchers asked two SPEAK test (Speaking Proficiency English Assessment Kit 1982) raters to score the audio-taped oral narratives of interactive elicited tasks between the researcher and the participant (Tarone et al. 2009). Those who scored between 1 and 6 in the literacy test were assigned in the low literacy group, and those who scored between 8 and 9 were assigned in the moderate literacy group. The data were analysed by comparing the relationship between literacy level and the ability to notice recasts in question formation (study 1), the participants' ability to notice recasts to their ability to perform oral elicited-imitation tasks (study 2), and the two groups' use of grammatical forms in their oral narratives (study 3). The initial sample of 35 participants took the L1 and L2 literacy tests. Those with the lowest scores were assigned to the low-literacy group, and those with the highest scores were assigned to the moderate-literacy group. These two subsets took part in study 1.

Study 1 partially replicated Philp's (2003) study with university students on their recall of recasts of their own errors while producing questions. While Philp investigated the impact of the recast length, the number of changes in the recast, and the learners' own proficiency level on recall accuracy, Tarone et al. (2009) only looked at the impact of the first two variables. Spot-the-difference and story-completion tasks were used to elicit questions from participants. To begin with, the moderate-literacy group outperformed the low-literacy group both on correct recall (mean proportion 0.6 (low) and 0.8 (moderate)) and on correct and modified recall (mean proportion 0.85 (low)

and 0.9 (moderate)) with difference approaching significance (*p<0.05*). A recall was *correct* when the participant's response would match the recast (e.g. trigger: *What she doing?*; recast: *What is she doing?*; recall: *What is she doing?*). A recall was considered *modified* when if only slight changes were made in the recast (e.g. trigger: *He is surprised?*; recast: *Is he surprised?*; recall: *Is he is surprised?*) (Tarone et al. 2009: 59).

The moderate-literacy group was better than the low-literacy group at remembering and repeating the researcher's corrected utterance, which confirms the findings of the L1 studies discussed earlier, i.e. that the impact of L1 alphabetic print literacy in the cognitive processing of oral language does not limit itself to the L1. It helps L2 learners to notice forms that they produce differently. In addition, similar to Philp (2003), Tarone et al. found that the more changes made in the recast, the less accurate the repetition of recasts from the low-literacy group was. Only in the *correct and modified recall* condition with two or more changes was the difference between the two groups significant (mean proportion 0.8 (low) and 1 (moderate); *p=0.01*). Therefore, the moderate-literacy group recalled a larger proportion of correct or modified recasts with two or more changes than the low-literacy group. The contribution of this study is two-fold: it confirms that decoding skills made available by alphabetic print literacy influence oral processing, while this is the first evidence that this influence extends to L2 oral processing.

Results of study 1 present some differences from Philp's (2003) study. Firstly, there was no significant difference in the performance of the two

groups with respect to recast length. One possible explanation could be that low-literacy L2 learners' cognitive processing differs from that of literate learners, who apply their metalinguistic skills to analyse recast length (related to form). It is already known that lack of print literacy skills does not impede processing based on semantics. A second explanation could be the inclusion of both correct and modified responses as opposed to Philp's count of only correct learner responses. Tarone et al. point out the need for further research in order to draw clearer conclusions.

In study 2, participants were exposed to 28 questions through elicited imitation. Contrary to the recast task, the elicited imitation task contains decontextualized sentences and the participant's task is to repeat the stimuli produced by the researcher. The content of this task is easier to control in order to test specific grammatical phenomena. The aim of study 2 was to investigate the influence of literacy on the accuracy of recall in question formation by comparing the two tasks. The researchers predicted that the moderately literate group would produce more accurate target sentences than the low-literacy group, and that both groups would perform better in the recast than in the elicited imitation task.

It is worth mentioning that the accuracy results reported here for the recast task are different from the results of study 1 since the participants' responses for both tasks were scored differently. The interrogative form ('Q-form') had three ratings: *no recall* when the participant did not produce enough for the experimenter to judge accuracy (e.g. Researcher: *How do you get to the*

market?; Ghedi: *market*); *grammatical Q-form* when the target sentence was grammatical (e.g. Researcher: *Would you ask if I can attend?*; Faadumo: *Will you ask if ah I can [tenay]?*); and *ungrammatical Q-form* when the recall contained an ungrammatical question formation in terms of word order, aspect and auxiliary use (e.g. Researcher: *Where have the kids been this weekend?*; Faadumo: *Where they have the kids been this weekend?*) (Tarone et al. 2009: 84-85).

The researchers' predictions were supported by the results in that the moderately literate group outperformed the low-literacy group in both tasks. In the recast task, the former recalled 77% of grammatical Q-form recasts, while the low-literacy group recalled 62% of grammatical Q-form recasts (*p=0.01*). In the elicited imitation task, the moderately literate group outperformed the low-literacy group approaching significance (*p=0.057*). Interestingly, the two groups' performance followed opposite directions. The low-literacy group scored higher in the production of ungrammatical Q-forms (58%) than in grammatical Q-forms (31%) with *no recalls* constituting 11% of the responses. On the other hand, the moderately literate group performed higher in the repetition of grammatical Q-forms (57%) than in the repetition of ungrammatical Q-forms (41%) with *no recalls* constituting only 2% of the responses. These results show an overall difficulty of the low-literacy group recalling de-contextualised language.

As expected, both groups produced significantly more accurate responses in the recall task than in the elicited imitation task (*p=0.00*). The highest

percentages for both groups regarding the production of grammatical Q-form recalls occurred in the recast task (62% for the low-literacy group and 77% for the moderately literate group). Undoubtedly, alphabetic print literacy facilitates the recall of oral L2 question prompts in both types of tasks, which confirms the findings of study 1 for the recast task. Findings so far support the hypothesis that enhanced literacy skills contribute to better noticing and processing of certain L2 oral input.

Study 3 focused on the production of three interlanguage features during the oral description of a series of pictures: semantically redundant verbal morphemes (e.g. *–s, -ed*) and plural markers on regular nouns (e.g. *–s*), articles and demonstratives, and dependent and cause and effect clauses (e.g. *so, because, that*). The aim of this study was to identify whether the use of morpho-syntactic features and sentence complexity of the two groups were the same, as Ravid and Tolchinsky (2002) argued that sentence complexity develops alongside linguistic literacy. In this task, participants had narrated a story by asking the researcher questions on a series of pictures. They then had to look at the pictures once more and retell the whole story by memory. The researchers point out that the small number of the target features produced in the narrative data do not allow for any statistical measures of significance to be applied.

With regard to the use of semantically redundant grammatical morphemes, both groups performed variably with the low-literacy group producing more 'bare verbs' (no morphological marking, e.g. *–ing, -ed, -s, 64%*) than the

moderately literate group (e.g. moderately literate KHALID: *So, she called him*; low literate FAWZIA: *Somebody call him*). Low literate participants produced verbs that lacked inflection ('bare verbs') more than half of the time, as opposed to 36% of the moderately literate participants' oral production. Moreover, the moderately literate group outperformed the low literates in noun plural marking by omitting plural *–s* 23% of the time. Low literates failed to provide noun plural marking half of the time ('bare nouns', 52%) and used *a lot of* in several cases (e.g. low literate UBAX: *A lot of monkey_ they take his hat_*; moderately literate KHALID: *The monkeys took all his hats*) (Tarone et al. 2009: 102).

Findings regarding article use were mixed. The moderately literate participants performed marginally better in mentioning more articles (237) than the low literate group (207). However, the latter was more accurate than the moderately literates in the target-like use (formula (number correct in obligatory context)/(number of obligatory contexts)+(number of incorrect contexts); Pica 1983) of the indefinite article (*a*), whereas use of the definite article (*the*) was the same for both groups. Finally, the moderately literate group used more complex sentences than the low literate group (dependent clauses with *because*: 131 versus 72; *so*-clauses: 44 versus 18; relative clauses: 28 versus 8). Table 3.1 below is an example of how the two groups interacted with respect to sentence complexity.

Table 3-1. Differences in the oral production of the two groups in sentence complexity (Tarone et al. 2009: 106)

Participant	**Utterance**
(a) KHALID (moderate literacy)	He looked up and then he saw *the monkeys wearing them so* he threw a mango *that they threw on a ground that was on it before then* he threw it and they threw a mango at him.
(b) ABUKAR (low literacy)	Some monkeys took his hat and try to play with him and now he's right here and try to throw mangos to the monkeys and a monk threw back to um to him um mangos, just laughing.

Khalid was able to form dependent clauses (*that*) and clauses with *so,* while Abukar did not use any at all, juxtaposing sentences one after the other with the coordinator *and*. Lack of verb inflectional morphology is also evident in Abukar's speech (*try* instead of *tried; try* instead of *tries*).

Low literate participants performed poorer than the moderately literate participants did in all aspects. These findings support the thus far findings on the influence of alphabetic print literacy in the production of the oral L2 skills. However, the researchers point out the need for further research, especially

in the case of articles and sentence complexity. The scholars also address the question of how differences in working memory capacity might influence oral L2 acquisition and potentially lead to differences in the acquisition of linguistic competence for future research. Tarone et al.'s findings show that low literate adult L2 learners' language consists of simpler structures than that of their relatively literate counterparts. Another explanation for the differences that occured between the two groups lies within the theory of Organic Grammar (Vainikka et al., 2017), according to which L2 learners' initial development is based on the production of non-finite verbs, followed by the syntactically essential parts of those verbs. Inflectional morphology occurs gradually at stages 3 and 4. Thus, it could be the case that Tarone et al.'s low-literacy learners were at a lower developmental stage than those in the moderate literacy group. Finally, it could also be the case that lack of literacy means learners potentially remain at lower stages for a longer time (Mocciaro, 2019).

In what follows, Ellis (2008, 2017) provides a theory about the reasons why learners fail to acquire certain L2 structures more than others do. He specifically makes a case for the acquisition of inflectional morphology.

3.3 Selective Attention in L2 Acquisition

In an effort to answer the question why L2 acquisition fails to create construction learning in the same way as L1 acquisition does, N. Ellis (2008) introduced the notion of 'associative learning'. 'Associative learning' deals with the reasons why humans retain more information about certain stimuli

than about others (LePelley et al. 2011) and why they make certain associations between a cue and an outcome. ‘Cue’ refers to the information to which a listener is exposed in natural language. According to Bloom and Wynn (1997), there are two kinds of linguistic cues: syntactic and semantic. Syntax gives out information when a word’s position in a sentence reveals some of its characteristics, while semantics provide information about the meaning of the cue based on the surrounding context. An outcome, on the other hand, refers to the interpretations that individuals assign to the cues that they come across.

The interpretation that humans assign to cues depends on how they perceive the world (Ellis et al. 2013), and the way humans perceive the world depends on their prior learning experience. The more often an outcome occurs during one’s past learning, the more chances there are for that outcome to be associated to the target cue. Therefore, a cue’s learnability is determined by frequency of occurrence in the input, by how essential that cue is to meaning and by the associations that the learner makes between the two (Ellis et al. 2013; LePelley et al. 2011).

Since one single cue seemingly the same can have more than one possible interpretation, learners filter their choices by using what is known as selection effects. For instance, the grammatical morpheme *–s* in English marks both the plural number in nouns and the third person singular in verbs. During selection effects, learners create associations based on their overall language learning experience. In this case, learners have to make an

association based on the position of the morpheme in the sentence during previous encounters. This association makes it possible for the learner to choose one of the two possible interpretations for this specific cue. These associations between the cue and the outcome are based both on frequency and on contingency, i.e. how much the learner can rely on this form in order to predict the nearest possible interpretation.

Selective attention takes place due to the meaning-form mappings that learners need to perform. With mappings being a rigorous and mentally exhausting process, learners need to be selective about the input that they process (Ellis and Sagarra 2010). Despite all of this, the L2 learner's speech lags behind that of the L1 speaker. There are naturalistic learners who might not notice the discrepancies between the two languages or achieve a native-like level of the target language possibly due to the lack of explicit attention drawn to these cues. The result is a 'basic variety' of the L2 interlanguage, which usually consists of uninflected open-class words (e.g. nouns and verbs) and rarely of any closed-class words (e.g. subordinators and prepositions) (Ellis and Sagarra 2010). However, closed-class words and grammatical morphemes are the most frequent items in language (Ellis and Sagarra 2010: 555). So, why does the L2 learners' interlanguage lack some of the most frequent elements of speech?

This happens because cue salience is one of the determining factors of selective attention. Salience is subjective and refers to how one perceives the strength of a stimulus, which means that more than one perception exists

for the strength of a single stimulus. According to Ellis (2016), there are three things to consider in salience: the surrounding environment, the defining properties of cues (affordances) and their importance to the learner, and the learner's expectations. If the expectations of cues already known to learners are contradicted, learners are taken by surprise. If these expectations are reinforced through confirmation, this adds up to their overall learning experience. Therefore, it is not possible to have an entirely "objective" salience, since the latter is driven by the stimulus-learner-context complex (ibid.).

Consequently, frequency is not sufficient for acquisition to take place due to the various degrees of salience that determine the cues used in a sentence (Ellis et al. 2013). For instance, although grammatical morphemes, such as the past tense ending *–ed*, are highly frequent items, they are also so well-entrenched in the language that they become part of the word phonologically, not allowing the learner to perceive their existence. In addition, this makes them less noticeable than lexical cues, such as temporal adverbs (e.g. *yesterday*). Frequency of use in the case of morphemes causes such automatisation that the learner tends to abbreviate these forms by neglecting to produce them. Consequently, morphemes become cues of low salience, which drops chances of learnability considerably. The *-ed* in *yesterday I studied* does not allow for it to be noticed and processed due to low saliency (Ellis and Sagarra 2010).

Even native speakers have trouble identifying grammatical morphemes almost 50% of the time when the latter are presented in isolation (Herron and Bates 1997; in N. Ellis 2008: 380). That is, although fluent native speakers are aware of the existence of the grammatical markers, they do not necessarily distinguish the morpheme from the rest of the word. Therefore, one can only imagine how challenging it is for the L2 learners to recognise and learn the function of these morphemes. The use of high salience yet less reliable cues, when other cues with low salience are required, leads to *fossilisation*, i.e. when the errors that occur are a result of the learners' efforts to create their own linguistic system by drawing conclusions for both languages. As N. Ellis (2006: 170) concludes, 'the amount of learning induced from an experience of a cue-outcome association depends crucially upon the salience of the cue and the importance of the outcome.' As long as the available interpretation makes sense and does not impede communication, the learner will continue to say *yesterday I walk*.

In an effort to figure out the order of acquisition of five L2 grammatical functors (progressive *-ing*, plural *-s*, possessive *-s*, articles *a, an, the*, third person singular present *-s*, and regular past ending *-ed*), Goldschneider and DeKeyser (2001) conducted a meta-analysis on '12 morpheme order studies'. Their aim was to find out whether a combination of five determinants, i.e. perceptual salience, semantic complexity, morphophonological regularity, syntactic category, and frequency, accounted for the total variance found in acquisition order. 'Perceptual salience' refers to the easiness of perceiving a given structure (Goldschneider and DeKeyser

2001). ‘Semantic complexity’ occurs when one single form, such as the ending *-s*, holds more than one meanings. ‘Morphophonological regularity’ points to the influence that phonology has on the functors. ‘Syntactic category’ in this case refers to the characteristics that functors hold in a sentence based on the Functional Category theory, i.e. the grammatical information that these functors give. Lastly, ‘frequency’ refers to the number of times an element appears in speech.

These studies were shortlisted based on some common criteria. They all looked at English as an L2; they produced oral data; they studied either children or adults; they considered length of residence; they used the methodology that was used in the majority of cases, i.e. they evaluated the functors based on suppliance in obligatory context (SOC); all of the studies had to make available a percentage of the correct SOC for each functor; and they all looked at the functors under investigation. The researchers ran a multiple regression analysis to investigate the effect of the five predictors combined together on the dependent variable (scores for accuracy). The results showed that three factors significantly correlated with acquisition order individually (perceptual salience r=0.63; frequency r=0.44; and morphophonological regularity r=0.41). When these three determinants were combined with semantic complexity and syntactic category, they all accounted for 71% of the variance in acquisition order. In other words, the combination of the target determinants accounted for a significant amount of challenges met in L2 acquisition. This supported the researchers’ hypothesis

that the largest part of the variance was explained by a combination of these five factors.

I will now discuss the factors responsible for why some L2 features do not turn into intake. These factors occur from the influence that the embedding of the L1 on the L2 has, and provide explanations irrelevant to age for why L2 acquisition stops short. These factors are interference, overshadowing, and blocking.

When L1 influence takes place, there are two possibilities: positive influence, otherwise known as L1 transfer, and negative influence, or interference. Interference is what a speaker of more than one languages experiences when the norms of the L1 interfere with those of the L2 (Saville-Troike and Barto 2017). Errors occur either because the target L2 structure does not exist in the L1 or because the structure exists in both languages but in different ways. It is especially difficult for the language learner when something similar to the newly-acquired form already exists in the already-acquired language. In that case, the learner needs to restructure what is already set in the neural system into something new. That is challenging because there is the issue of prior learning obstructing the new learning that takes place. This is known as *Proactive Inhibition* (PI) and it happens because a prior association that the learner has made between A and B gets in the way of the new association between A and C. While increased input in the L1 means positive reinforcement of the language, increased input in the L2 could lead to the reinforcement of errors, creating this way an even more

erroneous acquisition of the target structure. Therefore, the challenges encountered in the L2 are due to the similarities and differences between the two languages.

So far, I discussed the possibility of having one cue that leads to more than one outcomes. Choosing one outcome depends on learner selection effects, which in turn show where each learner focuses their attention. However, there is also the possibility of coming across two different cues that express the same outcome. For instance, both the regular past tense ending *–ed* and the past tense irregular forms refer to the same outcome, the Simple Past. So, the learner needs to choose whether the target verb is regular or irregular in order to form the past tense. The most prominent (highly salient) cue prevails and is associated with the outcome. Since regular forms are more frequent than the irregular ones, they are also internalised more easily (Ellis et al. 2013). In addition, regular forms are usually the way native speakers and learners are first introduced to the past tense. Therefore, since individuals have already been introduced to this simple way of expressing the past, i.e. by adding the *-ed* morpheme at the end of the infinitive, they will apply it as the cue with which they are more familiar and encounter the most.

For instance, the verb *to go* is a frequently occurring lexical item that belongs to the verb-locative (VL) construction. Ellis and Ferreira-Junior (2009) found that for both native and non-native speakers of English, the verb tokens occurring in VL construction constituted the majority of the tokens, with *go* being the most frequent verb token. Thus, this is the case of a highly

frequent lexical item with an irregular (less frequent) past tense form. By being exposed to the *-ed* past tense ending as the basic way to form this tense and by coming across irregular yet frequent verbs like *go*, the speaker assumes that go is formed by adding the *-ed* ending like in many other cases. Thus, the result is *I goed* instead of *I went*. In this case, the learner regularises the irregular form by adding the regular inflection after the infinitive (Pica 1983).

When the speaker chooses one cue over another, this means that one of the two cues was overshadowed by the other. The result of the learner having overshadowed a cue is known as *blocking*. Blocking occurs from lack of equal attention to both cues, which happens automatically, and from shifting that attention to only one cue (usually the one learned first). Learner selection effects are based on salience. Once blocking takes place, it is difficult to draw the learner's attention back to the neglected cue (Kruschke and Blair 2000). Consequently, the chances for the low-salience cue, irregular forms in this case, to be learned decrease dramatically because the mind decides to permanently shift its attention to something more pertinent. Once a cue is associated with an outcome, it is more difficult for that outcome to obtain a new interpretation or any additional information.

However, it is also difficult for the learner to assign an interpretation to a cue that was not relevant in the past but became so later on. This is known as *latent inhibition*, which is a result of learned inattention. That way, the learner can turn his or her attention to cues that he or she considers more pertinent

at that given time. This takes place in order to “protect” the learner from paying attention to information irrelevant at the time of learning. Unfortunately, at the same time, it also blocks the learning of how to associate a new cue to an already acquired interpretation.

This theory is relevant to the current research due to its focus on inflectional morphology, which is the centre of attention of my research in Modern Greek. Inflections are often considered redundant, as they do not hinder the comprehension of the utterance. According to N. Ellis (2006), this happens more in L2 than in L1 acquisition because in the former learners are introduced to temporal adverbials (*yesterday, last year*), prepositional phrases (*in the morning*), and calendric reference (*Wednesday, 16 May*) before tense marking. Thus, this is the case of high-salience lexical items being introduced before low-salience inflectional morphemes (Ellis 2006a). Consequently, the learner focuses on the lexical items both due to their high level of salience and because they are introduced before the inflectional morphemes. On the contrary, in L1 acquisition, adverbs are taught long after the introduction of the grammatical morphemes. French is a good example of a language with rich inflectional morphology. In the sentence *hier nous sommes allés au cinéma* ‘yesterday we went to the cinema’, the verb phrase consists of the auxiliary *sommes* and the past participle *allés*. If learners can situate the temporality of the utterance based on the temporal adverbial *hier*, they will choose to ignore other cues whose outcome is the same (in this case, *sommes* and *allés*) (Ellis 2006a). The ability to express temporality through adverbs renders morphemes redundant. The learner can produce

the sentence **hier nous allons au cinéma* '*yesterday we go to the cinema' without any communication issues.

Something similar happens with inflections for number. When number is expressed in other ways, such as quantifiers, naturalistic learners tend to ignore the plural markings by producing the noun in the singular number (Pica 1983). The naturalistic L2 learners in Pica's study omitted plural *–s* endings in obligatory context for plural. For instance, instead of producing *Three boys are here*, they produced **three boy are here*. This happened more with the naturalistic group than with the instruction-only and mixed groups, with statistically significant differences ($\chi 2=17.02, df=1, p<0.00$ and $\chi 2=12.26, df=1, p<0.00$ respectively). Quantifiers are high-salience cues and are more easily recognisable than inflections, which are low-salience cues of phonologically absorbed by the noun they modify. Consequently, the learner is able to express plurality without having to pay any attention to inflections. Pica's learners blocked the grammatical morpheme *–s* because the quantifier that pre-modified the noun met the requirements needed to convey plurality. Therefore, when time came for the naturalistic L2 learners to acquire plurality through inflections, their automatically learned inattention did not allow them to pay any attention to those low salient cues. As long as quantifiers (high salience cue A) lead to the same outcome (X) as plural markings (low salience cue C), the learner will fail to associate C to X. In this case, the learner has "fossilised" with a 'basic variety' of interlanguage that lacks grammatical morphemes. Tarone et al. (2009) also found that their low-

literacy group tended to omit the plural ending *–s* and to replace it by quantifiers, such as *a lot of*.

All of the above refer to the tuning of the representations of language registered in the mind. However, registration, which requires attention, needs to take place before tuning (N. Ellis 2002). Schmidt (1990) discusses the importance of paying conscious attention to those features of input that are relevant to the target structure. This way, the learner will achieve to turn input into intake. However, explicit instruction helps to turn the learner's attention to those low salient cues, which do not normally turn into intake in the case of naturalistic acquisition. What happens, though, when those naturalistic learners have a low level of education in the L1?

All of the previous findings are based on advanced L2 learners who are highly educated in the L1 and have received instruction in the L2. There is a two-fold issue in this case: firstly, low education in the L1 implies that analytical and attentional skills are of a lower level than the skills of highly instructed learners. Secondly, low educated learners possibly acquired the L2 without having received any instruction when they arrived in the host country, which was the case for Tarone et al.'s Somali learners. Consequently, they are less advantaged than instructed learners, whose attention has been explicitly drawn to low salience cues. Low educated naturalistic learners might be fluent if they have spent many years in the host country, i.e. they might produce language similar to that of a native speaker by manifesting pauses, hesitations and reformulations of that language (Ellis,

2003). However, fluency does not guarantee accuracy; fluency is only part of a learner's overall oral proficiency, along with accuracy and complexity of the linguistic forms used by speakers (Housen and Kuiken, 2009). It will be interesting to see whether low educated naturalistic learners can be accurate by applying inflectional morphology in nouns and verbs of a language with rich morphology like Modern Greek.

3.4 Further Challenges to the Acquisition-learning Hypothesis

The findings of the current research might have implications for Krashen's (1982) hypothesis on language learning. Krashen distinguishes acquisition from learning and argues that they are two distinct ways of developing competence in the L2. He compares L2 acquisition to L1 acquisition in children, which is a 'natural' and subconscious process. Thus, for Krashen, those who acquire language through communication are not usually aware of that acquisition, as opposed to language learners who are exposed to a more instructional environment. Krashen uses the term 'language learning' to refer to a "driven" and conscious process. Learning is not only being aware of learning a language but also about being aware of the language rules and how to describe them. Consequently, acquisition and learning are two separate processes that cannot be turned into the other (the *non-interface* position).

Highly educated adult learners have learned to rely on their metalinguistic skills, which might impede a native-like level of acquisition of the L2. The analytical situation in which L2 learners usually find themselves during learning does not allow them to turn to an instinctive way of speaking despite years of exposure and practice in the L2. This divide originates both from the belief that unconscious acquisition is superior to conscious learning, as well as that knowledge gained through conscious processes cannot turn into acquisition equal to L1 acquisition. This implies that literate L2 learners never manage to turn their learning into acquisition. Therefore, Krashen's model opposes Schmidt's hypothesis.

Schmidt's hypothesis argues that the adult learner cannot acquire the L2 without noticing, for which analytical skills are essential. However, according to Krashen, those analytical skills impede spontaneous production and achievement of fluency in the L2. Thus, illiterates might be at an advantage, as this learning-acquisition distinction might end up being more suitable for the low literate adult learners who manage to acquire the L2 oral skills implicitly in a naturalistic environment potentially due to lack of analytical skills. Thus, as already suggested, lack of analytical skills in the illiterates might lead to a more "natural" and unconscious acquisition of the L2. Therefore, the *Acquisition-learning hypothesis* might be applicable to the target population of my study.

3.5 Reconsidering Developmental Stages of Second Language Acquisition

Stages of acquisition for L2 grammatical forms have already been identified by SLA researchers (e.g. Pienemann and Johnston 1987; Schumann 1978; Van Patten 1987). Typically, most studies of order of acquisition address literate L2 learners. Clahsen (1980, 1984), Clahsen et al. (1983), Meisel et al. (1981), and Pienemann (1980, 2005) report data from both longitudinal and cross-sectional studies (known as the *ZISA* projects). These studies were designed to investigate the development of word order in L2 German by uninstructed adult foreign workers with various L1s, namely Italian, Spanish and Portuguese. The data collection tools consisted of informal interviews, free conversations and language proficiency tests on morphosyntax.

In addition to finding evidence to suggest that L2 language learners follow the same developmental stages, regardless of the L1, the researchers also found large individual differences between participants who produced obligatory, though semantically redundant, grammatical morphemes, such as subject pronouns, modal and auxiliary verbs, prepositions and determiners, and participants who omitted these features. Unfortunately, the researchers did not say why this might be. Data regarding participants' education was collected, so we know that different participants had very different levels of education. However, this data was not correlated with the presence/absence of obligatory grammatical features, while there was no measure of literacy level for any participants.

Despite all of this, given the different levels of education, it is very likely that the participants also had very different levels of L1 literacy when they entered Germany. It is, therefore, plausible, particularly given findings from other studies (e.g. Becker et al. 1977; Kurvers 2002; Kurvers et al. 2006; Tarone et al. 2009; Young-Scholten and Naeb 2010; Young-Scholten and Strom 2006), that the different amounts of obligatory morphosyntactic features produced by the participants in the *ZISA* projects were related to participants' level of education/literacy.

Thus, it is worth investigating whether there is a link between the adult immigrants' L1 literacy level and the type of answers they provide with respect to morphology. In other words, since it is believed that print literacy development contributes to noticing, it seems likely that low-educated adults belong in a developmental stage lower than the possible developmental stages of learners who have received more formal schooling in the L1 (see Vainikka et al., 2017). In my study, where I measure the participants' literacy level, it will be interesting to see whether the low-educated group will neglect to use grammatical morphemes by providing answers similar to the answers of one of the groups in the *ZISA* projects.

When an L2 learner encounters language learning, the input is important in determining the outcome. Researchers like VanPatten (2003) and Wong (2005) define input as the language to which the learner is exposed under communicative circumstances, while Sharwood Smith (1993) specifies 'input'

as language data that can be potentially processed by the learner. Although input occurs both in naturalistic and instructional settings, in the latter, learners are exposed both to oral and written input, where print is used to enhance learning in every aspect. In addition, instruction also brings attention to form, which increases the chances of accuracy in the L2.

Sharwood Smith (1991) coined the term 'input enhancement', where the teacher manipulates grammatical phenomena through various techniques in order to attract the learner's attention. Sharwood Smith distinguished between two types of input enhancement: 'input flood' and 'textual enhancement'. 'Input flood' refers to the frequent occurrence of the target form in the hope that the learner will notice it, whereas 'textual enhancement' is a way to emphasise the target form by typographical means (e.g. underlining, highlighting, bolding and font size). I will now consider studies that look at textual enhancement in order to discuss the role that textual enhancement plays in the language learning of those who benefit from alphabetic print literacy in instructional settings

3.6 Pedagogical Implications

There have been mixed findings in the limited number of studies on textual enhancement. Some studies have found a positive effect of textual enhancement on the noticing of the target structures (e.g. Jourdenais et al. 1995). Others have found that drawing the learner's attention to form through text manipulation can have a negative impact on comprehension (e.g. Lee 007; Overstreet 1998), while there have been studies where textual

enhancement has had no effect on noticing (e.g. Loewen and Inceoglu 2016; Winke 2013).

Jourdenais et al. (1995) explored the effects of textual enhancement on the noticing of the Spanish preterit (e.g. *escuchó*-3sg.past 'heard') and imperfect past tense forms (e.g. *seguía*-3sg.imprf 'was following'). The aim of the study was to explore any relation between input enhancement and noticing, as well as how this relation might affect L2 production. The researchers hypothesized that textual enhancement would contribute to a better noticing and production of the target forms. Fourteen adult native speakers of English were tested. At the time of the study, they were attending second semester Spanish classes at Georgetown University, where they received formal instruction on the target structure six weeks prior to the study.

The participants were exposed to a written narration of 'Little Red Riding Hood' in Spanish. They had a dual task: to produce verbal protocols of what they were thinking after reading the text and while producing a written narrative based on the sample text and accompanying pictures. The text contained 18 preterit and 10 imperfect verbs. There were two versions of the sample text, namely enhanced and unenhanced. The unenhanced version was written in one font type and size. In the enhanced version, the target verbs were underlined and differed in font from the rest of the text. To distinguish aspects, preterit verbs were enhanced with the shadow effect, while imperfect verbs were bolded (see Table 3.2).

Table 3-2. Excerpts from the enhanced and unenhanced versions of the sample text 'Little Red Riding Hood' in Spanish (Jourdenais et al. 1995: 193)

Unenhanced Version	**Enhanced Version**
Un cazador que pasaba cerca escuchó los gritos de Caperucita. El cazador disparó al lobo y salvó a la niña y a la abuela que seguía viva en el estómago del lobo.	Un cazador que **pasaba** cerca **escuchó** los gritos de Caperucita. El cazador **disparó** al lobo y **salvó** a la niña y a la abuela que **seguía** viva en el estómago del lobo.

Participants were assigned to groups based on the pretest scores of a mid-term examination provided by the Spanish department, where learners had to fill in ten blanks in a text containing the target forms. The first task was to read the sample text. After reading it and while writing the narrative, the learner had to think aloud. The researchers hypothesised that the enhanced group would produce more language-episodes with the verbs in the target forms in the think-aloud protocols (V-episodes), and more accurate writing than the comparison group regarding the target forms.

In the verbal protocols, the enhancement group's speech production contained more V-episodes than the comparison group (*M=47.7%* and *M=44%* respectively). However, a Wilcoxon rank sums test (non-parametric) showed that this difference was not significant (*z=0.731, p=0.46*). A finer analysis revealed a significant difference between the two groups with respect to the explicit mentions of aspect, i.e. when participants had to refer to their decision regarding aspect explicitly. Thus, although there is no

significant difference between the two groups with respect to the overall amount of V-episodes, textual enhancement seemed to contribute to an awareness of aspect decision. The enhancement group showed a greater awareness in its verb aspect decisions than the control group (*M=68.5%* and *M=15%* respectively; *z=-2.2, p=0.03, η^2=0.60)*.

In the written production, the enhancement group exhibited both a larger number of target-like verb forms in obligatory contexts (median=93%) and a narrower score range (64-84%) than the comparison group (median=60%; score range: 10-74%). Wilcoxon rank sums test showed that the difference between the two groups in the percentages of correct verb aspect supplied in obligatory contexts was significant (*z=2.19, p<0.05, η^2=0.53)* (Jourdenais et al. 1995: 203). Therefore, textual manipulation through typographical means increases noticing of the target L2 form and has a significant effect on learners' output.

Loewen and Inceoglu (2016) also investigated the effect of textual enhancement on the noticing of the L2 Spanish past tense. The aim was to define to which extent textual manipulation increases both the learners' attention (perception) and awareness (knowledge) of the target forms. An eye-tracking device was used to determine participants' attention on visually enhanced text during a reading task as opposed to unenhanced text, while levels of awareness were determined by an exit questionnaire as a form of verbal report. Finally, a cloze test and an oral production task were used to

determine whether visual text enhancement influences learners' accuracy on the use of the Spanish past tense.

Thirty college-level students took part in the study. They were native speakers of American English at the end of their second semester of Spanish courses at the university, whereas 16 native speakers of Spanish acted as controls. Group assignment was random. The L2 learners had already received explicit instruction on the target form at the time of the study. Participants were tested individually in the following tasks for 30 to 45 minutes: reading task, cloze test, oral production task, and exit questionnaire. The researchers replicated the sample text of 'Little Red Riding Hood' for the reading task from Jourdenais et al. (1995). The text contained 28 past tense forms (18 preterit and 10 imperfect verb forms). The typographical cues used were font size, background colour, and underlining, while aspect was highlighted red for the imperfect and green for the preterit. The eye-tracker was used to provide information on '(a) the number of fixations for each targeted item, (b) the amount of time, in milliseconds, that participants spent looking at each targeted item, and (c) the duration of the first fixation' (Loewen and Inceoglu 2016: 99).

The cloze test was a modified version of Overstreet's (1998) test in that, instead of being provided with both forms and being asked to choose the correct one, this time participants were provided with the infinitive of the target verb (18 verbs) and were asked to write down the correct form. Similarly, the oral production task was replicated from Jourdenais et al.

(1995), where participants produced an oral narrative based on the picture cards showing the story of 'Little Red Riding Hood'. Finally, during the exit questionnaire, the enhanced group was asked whether they noticed any highlighted words in the text, which ones, and whether they focused more on the enhanced forms while reading, whereas the unenhanced group was asked whether they noticed any repeated forms.

The findings showed that the L2 learners did not benefit significantly from textual enhancement. For the reading task, the researchers found a significant difference between the L1 speakers' and the L2 learners' reading time. The L1 enhanced group spent an average of 375ms looking at each verb and the L1 unenhanced group an average of 282ms, whereas the L2 groups spent significantly more time looking at each verb (enhanced group *M=712ms*; unenhanced group *M=639ms; F (3, 42) = 13.217, p < 0.00,* η^2 *= 0.48*). A post-hoc Bonferroni test showed that the significant difference occurred between the L1 and L2 groups, while there were no statistical differences within groups between the two conditions. Thus, textual enhancement (condition) did not play a statistically significant role in the participants' different reading times between conditions.

The exit questionnaire was used to answer the second research question regarding levels of awareness of the target structures and had three possible levels. 'No awareness' meant that the target structure was not identified or was identified incorrectly; 'partial awareness' meant that the target structure was partially identified (e.g. that all enhanced items were conjugated verbs);

and ‘full awareness’ meant that the target structure was fully identified. 13% of the unenhanced group participants reported that they did not notice any recurring grammatical structures. Surprisingly, 56% showed full awareness of the target structure with 31% showing partial awareness. All enhanced group participants reported awareness of visually enhanced items in the text with only 26.5% showing full awareness. Another 26.5% was not aware that the target structure was the past tense, while 47% showed partial awareness by identifying that the enhanced items were all verbs. Therefore, enhancement was not related to greater levels of target structure awareness. On the contrary, more participants in the unenhanced group showed full awareness of the target structure (56%) as opposed to the enhanced group (26.5%). Table 3.3 below shows the mean scores of the cloze test and the oral production task, where results were statistically non-significant.

Table 3-3. Mean scores (and standard deviations) of the cloze test and the oral production task (modified, Loewen and Inceoglu 2016: 101)

	Enhanced		**Unenhanced**	
	Pretest	**Posttest**	**Pretest**	**Posttest**
Cloze test (max.:18)	*7.4 (4.24)*	*7.9 (4.57)*	*4.8 (4.10)*	*6.7 (4.29)*
Oral production task (% of target-like use)	*20 (16)*	*31 (24)*	*13 (15)*	*17 (19)*

With respect to the cloze test, both groups’ ability to mark aspect improved from pretest to posttest (enhanced group: *7.4* and *7.9* respectively; unenhanced group: *4.8* and *6.7* respectively), while the enhanced group

scored higher than the unenhanced group. Although there was a significant main effect for time (*F (1, 28) = 5.790, p = 0.02, η^2 = 0.17*), the main effect for condition was statistically non-significant (*F (1, 28) = 1.727, p = 0.24, η^2 = 0.06*). The interaction effect was also non-significant (*F (1, 28) = 1.56, p = 0.22, η^2 = 0.05*). Similar to the cloze test, the enhanced group outperformed the unenhanced group in the oral production task (pretest: *M=20%* and *M=13%* respectively; posttest: *M=31%* and *M=17%* respectively) with both groups scoring higher in the posttest than in the pretest. However, the only statistically significant main effect was for time (*F (1, 28) = 5.67, p = 0.02, η^2 = 0.168*) with the main effect of condition and interaction being statistically non-significant (*F (1, 28) = 3.04, p = 0.09, η^2 = 0.10* and *F (1, 28) = 0.885, p = 0.35, η^2 = 0.031* respectively).

To summarise, Loewen and Inceoglu's (2016) findings contradict those of Jourdenais et al. (1995) on the same target structure, while they agree with Leow's (2001) study on the Spanish formal imperatives, where no statistically significant differences were found between the enhanced and the unenhanced conditions. According to Loewen and Inceoglu (2016), one possible explanation could be the fact that participants were never explicitly instructed where to focus, a fact that normally contradicts standard classroom practice. Interestingly, both groups' performance improved from pretest to posttest, indicating that input flood contributes to improvement in the target features regardless type of input enhancement. The researchers conclude by arguing that the differences among types of input enhancement

might not be statistically significant, which might be worth considering when practitioners apply a focus on form approach in the classroom.

Cintrón-Valentín et al. (2019) investigated the effect of salience-raising of certain vocabulary and grammar features through textually enhanced captioned video. Their aim was to identify whether captioning can facilitate the acquisition of aspects of verb morphology in the L2 Spanish classroom. Captioning refers to the existence of text in multimedia video when that text is in the same language as the one spoken in the video. As opposed to subtitling, which is the use of the L1 as a means of translation for the L2, captioning resembles more target-like language and can be used to apply textual enhancement strategies on the target language. It is argued that captioned video might help to associate spoken and written form more than non-captioned video, as there are more chances of drawing the learner's attention to unknown forms through the presentation of multi-modal input (aural, written and visual). In other words, captions might increase salience of input by increasing the probability of cues with low prominence in speech, such as inflectional morphemes, to be attended by the learner (Winke et al. 2010). This argument resonates with theories of SLA, where learner attention and cue salience are essential prerequisites to learning (Schmidt 2001; Ellis 2017).

It is already confirmed that captioning has large effects on listening comprehension and vocabulary learning (see e.g. Huang and Eskey 1999; Muñoz 2017; Price 1983), while it could be particularly beneficial for the

learning of grammatical aspects that are less salient than others. Paying attention to form is more difficult than paying attention to meaning for two reasons: firstly, open-class words (e.g. nouns, adverbs) are more salient than bound morphemes. Secondly, it is more difficult to assign interpretations to morphological forms than to vocabulary. Lee and Huang's (2008) review on textual enhancement studies reveals conflicting findings on the effect of captioning for a number of reasons: L1-L2 pairings, learner proficiency, the target forms, and measures to assess performance. TE studies have only focused on the written form, neglecting sound and image, while there is also a limited number of the effects of TE studies on the acquisition of L2 grammar.

The aim of the study was three-fold: to examine the effects of full captions and TE on vocabulary and on grammar, and to determine whether any potential gains of these effects would last over time. Thus, there were three experimental conditions: a no-captions control group, a captions and TE vocabulary group, and a captions and TE grammar group. The target grammatical topics determined by the course syllabus were: preterite/imperfect forms (e.g. *caminé* 'I walked'/*caminaba* 'I was walking), the copula verbs *ser/estar*, *gustar*-type verbs, and the subjunctive in noun clauses.

The participants were 176 native speakers of English, who attended a Spanish Grammar course at a University in the USA (age range 17-29 years). They filled a pre-questionnaire with information on their demographics and language learning experience. Next, they were provided

with a 90-item Spanish vocabulary proficiency test, where they had to select words they recognised. In the 45-item Spanish proficiency test, participants were exposed to a short passage with multiple-choice and fill-in-the-blank options, while there were four immediate post-tests: a vocabulary recognition test, where participants were asked whether they were exposed to these words in the experimental session; a vocabulary translation test, where they were asked to provide a Spanish translation of specific English words; a grammar recognition test, where they had to choose the correct verb form out of two options; and a grammar translation test, where participants were asked to type the Spanish translation of sentences in English. Finally, participants were given delayed post-tests two weeks later, which differed only in that the target items were now in different sentence contexts.

The researchers also created a short video lesson for each of the four target grammatical structures, which was administered before the animated video and contained explicit instructions on the target items with practice exercises. Finally, the researchers created four unique animated videos with original scripts, recording voices, and animation due to their focus on specific grammar items. Each video had three versions, one for each experimental condition. After the proficiency test, participants were presented with the grammar lesson video, the relevant animated video, the vocabulary recognition and production tests, and the delayed post-tests two weeks later.

Results regarding vocabulary showed that there was an advantage of captioning video on both recognition and translation, with the Captions and TE Vocabulary group outperforming the Control and Captions and TE Grammar groups. In vocabulary recognition, there was a significant effect of group (Captions + TE Vocabulary: β = 1.352, SE = 0.087, p < 0.001; Captions + TE Grammar: β = 0.658, SE = 0.078, p < 0.001) with the two captioned groups being more accurate in vocabulary recognition than the control group. Similarly, in vocabulary translation, the captioned groups were more accurate than the control group (Captions + TE Vocabulary: β = 1.034, SE = 0.098, p < 0.001; Captions + TE Grammar: β = 0.524, SE = 0.105, p < 0.001).

For vocabulary, results showed positive effects both of captioning and TE in both the recognition and production tasks. Although vocabulary was not enhanced in any way in the control and Grammar groups, its effect through captioning was evident even in these two groups. These findings are supported by previous research (e.g. Montero-Perez et al. 2014). This might be the case of 'surprisal salience' (Gass et al. 2017), where learners might isolate infrequent items because they are unknown to them. This argument is enhanced even more by the fact that the researchers selected low-frequency target vocabulary. Thus, these two factors together might have contributed to drawing the learners' attention on vocabulary regardless of TE.

Results regarding grammar were mixed. The researchers ran a number of models for the grammar recognition task, which did not reveal any significant

interactions. In the immediate post-test of grammar translation, a generalised linear mixed effects model revealed significant differences between the control group and the captions and TE Grammar group for *gustar*-type verbs (β = 0.496, SE = 0.203, $p < 0.05$) and the subjunctive (β = 0.503, SE = 0.206, $p < 0.05$), while there was also an effect of captioning on the subjunctive in the captions and TE Vocabulary group (β = 0.525, SE = 0.199, $p < 0.01$). Similar results were found in the delayed post-test for grammar translation, where comparison of the control group against the caption and TE Grammar group revealed a significant effect for *gustar*-type verbs (β = 0.508, SE = 0.227, $p < 0.05$) and the subjunctive (β = 0.507, SE = 0.190, $p < 0.01$). Therefore, the significant effects found in the immediate post-test were maintained two weeks later.

One reason for these inconsistent findings might be the different structure-specific characteristics for each of the target structures, i.e. their syntactic and semantic properties, which require different processing. No significant differences were found for the preterite and the imperfect, which might be because the participants were expected to process two forms at the same time. Overstreet (1998) argued that TE might be more effective when directed at one form at a time instead of addressing the contrast of two forms. Lack of any differences for the *ser/estar* copula verbs might be due to the learners' intermediate level in Spanish, which is an indication of having already acquired this structure to the point that TE did not have any effect.

Effects of TE proved significant only for the *gustar*-type verbs and the subjunctive in noun clauses. For the *gustar*-type verbs, this might be the case because there are four types of *gustar*-type verbs based on their processing difficulty. The target items belonged to the Type 1 category, which is the easiest. This would explain the gains of applying TE in these verbs, which is why future research should apply TE in the other more challenging *gustar*-type verbs. Finally, despite the attested difficulty of the subjunctive form, it is still possible for learners to acquire it when it is broken down into simpler components. In the current study, learners were made aware of the main and the subjunctive verb, which facilitated their comprehension of this form. Overall, the researchers point out the need to consider the different properties of each grammatical structure before employing TE-captioned media in future research.

3.6 Conclusion

In essence, the *Noticing hypothesis* argues that learners need to notice the L2 forms in order to acquire them. In the case that they do not, instructional mediation is needed to facilitate L2 learning. The majority of the research testing the *Noticing hypothesis* refers to the part of the population considered highly educated in the L1 and which usually learns the L2 in an instructional environment. A number of advantages arise from receiving education in an alphabetic language. Exposure to various instructional environments combined with the cognitive benefits of language learning make a highly educated person much more aware than a low educated individual of how language functions. In addition, a cognitively mature individual also

possesses metalinguistic knowledge, which contributes to a better understanding of grammatical rules and a more accurate use of the L2.

Despite the positive correlation between L1 literacy and the acquisition of L2 oral skills, it is still possible for illiterate or low literate individuals to acquire the oral skills of an L2, and low educated immigrants around the world are the proof. Highly educated individuals assume that the more literate a person is, the more proficient that person will be in the L2. However, a literate mind cannot imagine how it is to learn an L2 without the tools gained while learning to read and write. Conscious analysis of the linguistic structures by literate adults with mature metalinguistic abilities might act as a hindrance and interfere with successful acquisition, which would support Krashen's (1982) *Acquisition-learning Hypothesis*. Since print literacy helps attend to more formal aspects of language, and based on the theory that analytical skills impede successful acquisition, low literate learners might be at an advantage over the highly literate ones, in that they are more likely to achieve fluency in the L2.

Overall, the number of studies addressed to the low educated population remains relatively scarce, considering the various contexts and linguistic features that need to be studied. Findings of the existing studies cannot be applied to the target population of my study, which are adult L2 learners who are low educated in the L1 and who have acquired the L2 through pure naturalistic input. Researchers have argued that agreement and tense marking (past tense specifically) are among the most challenging

grammatical phenomena (e.g. see Collins et al. 2009; Konta 2012). My experiments focus on these grammatical phenomena. However, lack of such forms does not hinder communication, meaning that naturalistic learners are still able to communicate in the L2 despite any inaccuracies or ungrammaticalities. The following research intends to investigate three grammatical phenomena in Greek as an L2, namely singular and number agreement, and the perfective past tense, in order to shed light to the acquisition of L2 morphosyntax by learners with a low educational background. However, before that, it is necessary to help the reader to understand how these linguistic phenomena work. What follows next is the linguistic background of agreement in Greek.

Chapter 4 – Gender and Number Agreement in Modern Greek

Linguistic and Research Background

4.1 Introduction

Greek differs from English in several aspects. It is characterised by a more flexible word order, subject dropping, and a highly inflected morphology in adjectives, nouns, pronouns, definite and indefinite articles, and verbs (Joseph and Tserdanelis 1987). This chapter provides an overview of nominal agreement in Greek, which is one of the current structures under investigation. This chapter is by no means an exhaustive source of information. Its aim is to provide a clear-cut description on the Greek nominal system and to refer the reader to some of the relevant studies on the target structure.

The chapter begins with an introduction on the syntax of noun phrases before going into details on the morphology of nouns. Next, it shows how nominal agreement takes place, and some of the findings on gender and number agreement.

4.2 Noun phrases, Noun Morphology, and Agreement

4.2.1 Noun Phrases

Noun Phrases (NPs) can either be in an attributive or a predicative position; in the attributive position, the words within the NP agree with the head noun in gender, case, and number (1), while in the predicative position, the NP (subject predicate) can be of a different gender than that of the subject it defines (2).

1. ***Τα*** ***ωραία*** ***λουλούδια*** **ανθίζουν την άνοιξη.**
   Ta oréa louloúðia anθízoun tin ániksi
   The-DEF.ART.NEU.PL.NOM nice-ADJ.NEU.PL.NOM flower-N.NEU.PL.NOM blossom in-the spring.
   'Nice flowers blossom in the spring.'

2. **Η** **Μαρία** **είναι** ***γιατρός*****.**
   I María íne jatrós.
   The-DEF.ART.F.SG Maria-N.F.SG be doctor-N.M.SG
   'Maria is a doctor.'

In example 1, the adjective *oréa* 'nice' in the attributive position has to agree with the noun in gender, case and number. However, that is not the case when the NP is part of the predicate as in example 2, where the word *jatros* 'doctor' (masc.) does not agree in gender with the subject *Maria* (fem.).

According to Holton et al. (2004: 20), 'a noun phrase may include another noun phrase in the genitive (3)[2], or a prepositional phrase (4), or a clause (5)', while it acts syntactically as[3]:

[2] Here, the NP in the GEN might depend on the NP in the NOM, since the former indicates possession and cannot stand on its own. If both NPs are in the same case (either NOM

- The subject of a verb (NOM: 6)
- The direct object of a verb (ACC: 7)
- The indirect object of a verb (GEN: 7)
- A subject predicate (NOM: 8)
- An object predicate (ACC: 9)
- The object of a preposition (ACC: 10)
- A way to address someone (VOC: 11)

3. **Το σπίτι *του Γιάννη***
   To spíti *tu Jáni*
   The-DEF.ART.NEU.SG.NOM house-N.NEU.SG.NOM the-ART.M.SG.GEN Jani-N.M.SG.GEN
   'Jani's house.'

4. **Το σπίτι *στη γωνία***
   To spíti *sti gonía*
   The-DEF.ART.NEU.SG.NOM house-N.NEU.SG.NOM in-the-ART.F.SG.ACC corner.N.F.SG.ACC
   'The house in the corner.'

5. **Το σπίτι *που αγόρασα***
   To spíti *pu agórassa*
   The-ART.NEU.SG.NOM house-N.NEU.SG.NOM that buy-V.1SG.PST
   'The house that I bought.'

6. ***Ο Στέφανος* θα έρθει αύριο.**
   O Stéphanos Θa érθi ávrio.
   The Stephanos-M.SG.NOM Ø come-V.3SG.FTR tomorrow.
   'Stephanos will come tomorrow.'

7. **Αύριο θα του δώσουμε *του Στέφανου τα ρούχα του*.**

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or ACC depending on their function), then the second NP indicates content, as shown below:

e.g. μία φέτα ψωμί
mía féta psomí.
a slice-F.SG.NOM/ACC bread-NEU.SG.NOM/ACC
'A slice of bread.'

[3] Modified, Holton et al (2004).

Avrio θa tu ðóssume *tu Stéphanu* *ta rúha tu.*
Tomorrow Ø Ø give-V.1PL.FTR the-Stephanos-N.M.SG.GEN the-clothes-N.NEU.PL.ACC his-PRO.SG.ACC
'Tomorrow we will give Stephanos his clothes.'

8. **Ο Γιάννης είναι *δάσκαλος*.**
O Jánis íne *ðáskalos*.
The-Janis be-V.3SG.PRS teacher-N.M.SG.NOM
'Janis is a teacher.'

9. **Τον διόρισαν *δάσκαλο*.**
Ton ðiórissan *ðáskalo*.
Him-PRO.3SG.ACC appoint-V.3PL.PST teacher-N.M.SG.ACC
'They appointed him a teacher.'

10. **Η Μαρία ήρθε από *τη Θεσσαλονίκη*** (ACC.)**.**
I María írθe apó *ti Θessaloníki*.
The Maria come-V.3SG.PST from the-Thessaloniki-N.F.SG.ACC
'Maria came from Thessaloniki.'

11. ***Στέφανε*!**
Stéphane-N.M.SG.VOC
'Stephane!'

4.2.2 Noun Morphology

Contrary to English, all nouns in Greek belong to declensions and are marked for gender, case, and number through inflections. More specifically, Greek contains three grammatical genders: masculine, feminine, and neuter. Semantics and grammatical gender do not always coincide in Greek (Mastropavlou and Tsimpli 2011), which means that the grammatical gender is not always indicative of the sex or the animacy of the noun. The nouns 'man' (*ándras,* male) and 'woman' (*ginéka,* female) are masculine and feminine respectively but the nouns 'girl' (*korítsi,* female) and the 'boy' (*agóri,* male) are both neuter, while objects like 'chair' (*karékla,* inanimate) and 'painting' (*pínakas,* inanimate) are feminine and masculine respectively.

Gender is learned at the same time as the noun and there are a few characteristics that might help to identify it (Holton et al. 2004: 27, 29):

- Masculine nouns always end in a vowel + *–s* in the nominative singular. In the accusative they drop the *–s*. The genitive singular is the same as the accusative, with the exception of nouns in *–s*, which have genitive in *–ou*.
- Feminine nouns, except for one type, have the same forms for nominative and accusative singular, which end in a vowel. For the genitive singular, they add *–s*. The exception is nouns ending in *–os*, which follow the same pattern as masculine nouns in *–os*.
- Nouns of common gender may be either masculine or feminine, depending on the sex of the person they refer to. They follow the pattern of the corresponding masculine nouns ending in *–as, -is, -os* or *–éas*.
- Neuter nouns have a single form for the nominative and accusative cases both in the singular and the plural number. The plural typically ends in *–a*, with the exception of nouns in *–os*.
- The genitive plural of nouns of all declensions ends in *–on*.

Furthermore, Greek has four cases: nominative, genitive, accusative, and vocative. The nominative is used when the noun functions as a subject, the accusative when the noun functions as an object, and the vocative is used to address someone. The genitive case has more than one function: it shows possession (the equivalent of *–'s* or the preposition *of* in English; see e.g. 3), the subject (12) or the object (13) of an action, the place, the time or the

cause (14), the relation of something with the whole (15), duration and size (16); it gives additional information about the first noun (17). Lastly, the genitive is also used with names of streets or parks (18), as well as with women's last names (19).

12. Το γέλιο *του* *μωρού*.
To gélio tou moroú.
The laughter the-DEF.ART.NEU.SG.GEN baby-N.NEU.SG.GEN
'The laughter of the baby.'

13. Η οδήγηση *του* *Γιάννη*.
I oðígissi tou Jáni.
The driving the-DEF.ART.M.SG.GEN Jani-N.M.SG.GEN
'Jani's driving.'

14. Τα φρούτα *του* *καλοκαιριού*.
Ta froúta tou kalokerjú
The fruits the-DEF.ART.NEU.SG.GEN summer-N.NEU.SG.GEN
'The fruits of the summer.'

15. Οι σελίδες *του* *βιβλίου*.
I selíðes tu vivlíu
The pages the-DEF.ART.NEU.SG.GEN book-N.NEU.SG.GEN
'The pages of the book.'

16. Δρόμος *εκατό* *μέτρων*.
Ðrómos ekató métron.
Street one-hundred-ADJ.NEU.PL.GEN metres-N.NEU.PL.GEN
'A one-hundred-meter street.'

17. Καθηγητής *Ιστορίας*.
Kaθigitís Istorías.
Teacher-N.M.SG.NOM history-N.F.SG.GEN
'Teacher of history.'

18. Οδός *Αθηνάς*.
Oðós Aθinás.
Street-N.F.SG.NOM Athinas-N.F.SG.GEN
'Athinas Street.'

19. Η κυρία *Πέτρου*.
I kiría Pétru.
The-Ms-N.F.SG.NOM Petru-N.F.SG.GEN
'Ms Petrou.'

The plural number is formed by the addition of inflectional suffixes, which is the most common technique to mark number (Stephany 1982). However, the primary role of the plural number is to mark the relations among the constituents of a sentence. It is not only the inflectible elements of a noun phrase that have to agree with each other but also other elements of the same sentence related to that noun phrase. Thus, when various elements of the same sentence are marked for number, this is an indication of syntactic relatedness (ibid.).

Traditional grammar books categorise nouns based on the number of syllables and the ending of the nominative singular. These are known as 'Inflectional Classes' (IC). Holton et al. (2004) divide nouns into two categories: parisyllabic and imparisyllabic. Parisyllabic are the nouns that have an equal number of syllables in both the singular and the plural (e.g. *mi-tér-**a***.F.SG.NOM 'mother'; *mi-tér-**es***.F.PL.NOM 'mothers'), while imparisyllabic are the nouns that form the plural number by adding an additional syllable (e.g. *pap-**oús***.M.SG.NOM 'grandfather'; *pap-**oúd-es***.M.PL.NOM 'grandfathers'). Next, nouns are divided based on gender, and the ending within that gender. Holton et al. make the following categorization[4]:

[4] For a more detailed overview of all noun declensions and special categories of nouns, read Holton et al. (2004: 27-53).

Table 4-1 Greek nominal classes (Based on Holton et al. 2004: 28)

Parisyllabic			**Imparisyllabic**		
M	**F**	**N**	**M**	**F**	**N**
-as	*-a*	*-o*	*-as*	*-á*	*-ma*
-is	*-i; (*PL*: -es)*	*-os*	*-is*	*-ú*	*-imo*
-os	*-os*	*-í*	*-és*	*-o*	
-éas	*-i; (*PL*: -is)*	*-i*	*-ús*		

Another approach (e.g. see Kourmoulis 1964; Klairis and Babiniotis 1996) classifies nouns based on the 'degree of syncretism' among cases, meaning on whether nouns employ different forms in the nominative and the genitive (IC 1), in the nominative, genitive, and accusative (IC 2), or either of the above ('mixed class, e.g. *póli*$_{NOM/ACC}$ – *pólis*$_{GEN}$ or *pólis*$_{NOM}$ – *póleos*$_{GEN}$ – *póli* – n$_{ACC}$ = city'; Matropavlou and Tsimpli 2011: 33). However, Ralli (1994, 2002, 2005) argues that syncretism is not sufficient to distinguish nouns and create declension classes. She bases her noun classification in morphological criteria and distinguishes eight classes, less than Holton et al. (2004). In her classification, there is more than one gender in each class, whereas one ending may have more than one gender (see Table 4.2). For instance, in IC1, *-os* can be both masculine and feminine.

Table 4-2 Nominal Inflectional Classes (Based on Ralli 2002 2005)[5]

IC1	***IC2***	***IC3***	***IC4***
[-os]: Msc/Fem	***[-s]: Msc***[6]	***[Ø]: Fem***	***[Ø]: Fem***
-os ánΘrop***os***$_{MSC}$	***-as***	***-a***	***-i*** póli$_{FEM}$[7]
(=human)	tamía***s***$_{MSC}$	mitéra$_{FEM}$	***/pl:-is*** *(=city)*
	(=cashier)	*(=mother)*	*[-ης/-εις]*
	-is	***-i*** avlí$_{FEM}$	
psíf***os***$_{FEM}$	mahití***s***$_{MSC}$	***/pl:-es*** *(=yard)*	
(=vote)	*[-ης]* *(=fighter)*	*[-η/-ες]*	
	-es kafé***s***$_{MSC}$	***-ou***	
	[-ές] *(=coffee)*	alepoú$_{FEM}$	
	-ous	*[-oú]* *(=fox)*	
	papoú***s***$_{MSC}$		
	[-oúς] (=grandpa)		

IC5	***IC6***	***IC7***	***IC8***
[-o]: Neut	***[Ø]: Neut***	***[-os]: Neut***	***[Ø]: Neut***
-o voun***ó***$_{NEUT}$	***-i*** spíti$_{NEUT}$	***-os***	***-ma*** sóma$_{NEUT}$
(=mountain)	*[-ι]* *(=house)*	krát***os***$_{NEUT}$	*(=body)*
		(=state)	

[5] In Mastropavlou and Tsimpli (2011: 34).

[6] One of the differences with Holton et al.'s classification is that Ralli does not consider the vowels before the *–s* as part of the inflection; thus, in this case, all masculine nouns ending in *–s* are under the same category. In addition, she does not base her classification on number, meaning that she does not distinguish nouns based on the different number of syllables in the two numbers.

[7] Ralli puts nouns ending in *–i* in two different categories, even though they are both feminine, mainly because they have different endings in the plural (even if her categorisation is not based on this feature). Stress also differs (***póli***;***avlí***); thus, there are also nouns of the same gender with the same ending but with a different positioning of the stress.

One last point to remember is that some endings across genders and cases are the same. Table 4.3 is indicative of the similarities that exist across nouns. Although *ánθrop**os*** ‘human’ and *próoð**os*** ‘progress’ belong to different genders, their inflections are identical across all cases in both numbers, while all neuter nouns, like *krát**os*** ‘state’, have the same inflections in the nominative and the accusative case in both numbers.

Table 4-3 Examples of similarities across genders and cases

		MASC	**FEM**	**NEU**
SINGULAR	**NOM**	*ánθrop**os***	*próoð**os***	*krát**os***
	GEN	*anθrópou*	*proóðou*	*krátous*
	ACC	*ánθrop**o***	*próoð**o***	*krát**os***
	VOC	*ánθrop**e***	-	-
PLURAL	**NOM**	*ánθrop**i***	*próoð**i***	*kráti*
	GEN	*anθrópon*	*proóðon*	*krat**ón***
	ACC	*anθrópous*	*proóðous*	*kráti*
	VOC	-	-	-

I will now discuss how nominal agreement is applied in Greek.

4.2.3 Singular and Number Agreement

The gender system in Greek is transparent, in that there are morpho-phonological cues that determine the gender of the noun. Thus, all the constituents of a NP should agree in gender, number, and case with the head noun. Since all the declinable components of a NP agree with the head

noun, their inflections are another way of identifying gender, number and case. A NP might contain a definite or an indefinite article (20 and 21 respectively), a determiner (anything other than articles, adjectives and numerals; 22), one or more adjectives (23 and 24 respectively), a numeral (25) or a quantifier (26)[8].

20. ***Τα*** **παιδιά** **κλαίνε.**
Ta peðjá kléne.
The-DEF.ART.PL.NEU.NOM children-N.PL.NEU.NOM cry-V.3PL.PRS.
'The children are crying.'

21. ***Ένα*** **παιδί** **κλαίει.**
Éna peðí kléï.
A-INDF.ART.SG.NEU.NOM child-N.SG.NEU.NOM cry-V.3SG.PRS.
'A child is crying.'

22. ***Κάποιο*** **παιδί** **κλαίει.**
Kápjo peðí kléï.
Some-DET.SG.NEU.NOM child-N.SG.NEU.NOM cry-V-3SG.PRS.
'Some child is crying.'

23. **Έχεις** ***ωραίο*** **χαμόγελο.**
Éhis oréo hamógelo
Ø Have-AUX.2SG.PRS nice-ADJ.SG.NEU.ACC smile-N.SG.NEU.ACC[9]
'You have a nice smile.'

24. **Θέλω ένα** ***ωραίο*** ***μεγάλο*** **ποδήλατο.**
θélo éna-oréo megálo poðílato
Ø want a-nice-ADJ.SG.NEU.ACC big-ADJ.SG.NEU.ACC bicycle-N.SG.NEU.ACC.
'I want a nice, big bicycle.'

25. **Είμαστε από τους** ***πρώτους*** **επιζήσαντες.**
ímaste apó tous prótus epizíssandes.
Ø be-AUX.1PL.PRS from the-ART.PL.M.ACC firstNUM.PL.M.ACC survivors-N.PL.M.ACC
'We are among the first survivors.'

[8] Holton et al. (2004).
[9] Greek does not use any articles 'with the object of a verb, where the speaker does not wish to stress that the object is specific or definite' (Holton et al. 2004: 82).

26. Αγόρασα ***μερικές*** **πατάτες.**
Agórassa merikés patátes.
Ø buy-V.1SG-PST some-PRO.PL.F.ACC potatoes-N.PL.F.ACC
'I bought some potatoes.'

The indefinite article is declined for gender and case, and is also used as the numeral 'one', with a slight difference in the stress of the feminine gender, as shown in Table 4.4:

Table 4-4 The Indefinite Article in Greek

	MASC	**FEM**	**NEU**
NOM	*énas*	*miá (mía = one)*	*éna*
GEN	*enós*	*miás*	*enós*
ACC	*éna(n)*	*miá(n)*	*éna*

The definite article is declined for gender, number, and case, and has as follows:

Table 4-5 The Definite Article[10]

	Singular			**Plural**		
	M	**F**	**N**	**M**	**F**	**N**
NOM	*o*	*i* (η)	*to*	*i* (οι)	*i* (οι)	*ta*
GEN	*tu*	*tis* (της)	*tu*	*ton* (των)	*ton* (των)	*ton* (των)
ACC	*ton*	*ti(n)*	*to*	*tus*	*tis* (τις)	*ta*

Another characteristic of the definite article is that it always posits before a Proper Name (PN). PNs of animate or inanimate objects without a definite

[10] Articles, especially in the nominative case, help to identify the gender value of the noun. Nonetheless, there are some cases across genders that are identical and require attention (e.g. '*tu*': SG.GEN.M/N; '*i*' (οι): PL.NOM.M/F; '*ton*' (των): PL.GEN.M/F/N.)

article are considered to be ungrammatical, unless they are in the vocative case (see e.gs 2, 3, 6-8, 10, 11 (VOC), 13, 19). Longobardi (1994, 1996), Marinis (1998), Penner and Weissenborn (1996), and Roussou and Tsimpli (1994) call these articles *expletives*, meaning that they perform a syntactic role but do not influence semantics. In this case, the expletive article helps to turn the predicate nature of PNs into an argumental one, since PNs tend to appear in an argumental position despite their predicate nature (Marinis 1999). Therefore, the use of the expletive article allows PNs to be in an argumental position, as shown in (27):

27. O Giánnis aghapái ti María.[11]
The Giannis loves the Maria
'Giannis loves Maria.'

Adjectives are also declinable and can be either in an attributive or in a predicative position. When in an attributive position, they are in the same phrase as the head noun and agree in gender, case and number (1); when in a predicative position, they are in a different phrase from the head noun that functions as a subject and agree in gender, number and case (28).

28. Το σπίτι είναι παλιό.
To spíti íne paljó
The-DEF.ART.SG.NEU.NOM house-N.SG.NEU.NOM is old-ADJ.SG.NEU.NOM
'The house is old.'

Holton et al. (2004) make the following adjectival classification[12]:

[11] Marinis (1999: 3).
[12] For a more detailed account of all cases, as well as special categories of adjectives, see Holton et al. (2004: 54-63).

Table 4-6 ICs of Adjectives (Based on Holton et al. 2004)

	Singular	**Plural**
M	*-os, -os, -os, -is*(ύς), *-is*(ης), *-is*(ης), *-on*(ων)	*-i*(οί), *-i*(οι), *-i*(οί), *-i*(οί), *-ís*(είς), *-is*(εις), *-ondes*(οντες)
F	*-i*(η), *-a, -ia, -iá, -iá, -is*(ης), *-ussa*(ουσα)	*-és, -es, -és, -iés,* *-ís*(είς), *-is*(εις), *-usses*
N	*-o, -o, -o, -i*(ύ),*-í, -es, -on*(ον)	*-á, -a, -á, -iá, -í*(ή), *-i*(η), *-onda*

When in the attributive position, adjectives usually pre-modify the noun (1). In the case of a post-modifier, special emphasis is put to the noun (29):

29.	**Ένα**	**σπίτι**	**παλιό**
	Ena	spíti	paljó
	A-INDEF.ART.SG.NEU.NOM	house-N.SG.NEU.NOM	old-ADG.SG.NEU.NOM
	‘An old house.’		

However, in the case of a definite article, the latter must be repeated before the adjective (30):

30.	***Το***	**σπίτι**	***το***	**παλιό**
	To	spíti	*to*	paljó
	The-ART.SG.NEU	house-N.SG.NEU	the-ART.SG.NEU	old-ADG.SG.NEU
	‘The old house.’			

Both examples emphasise the fact that the house is old as opposed to other houses in a different condition. What follows next is a review of past studies on agreement in Greek.

4.3 Studies on Agreement

Studies have looked at agreement in L1 and L2 Greek both in children and adults. Most of the L1 child studies have explored children's morphological awareness, including of agreement, in pre-school and early school years and how this awareness relates to their literacy skills. Desrochers et al. (2018) showed that morphological awareness seems to be a more significant predictor of spelling than of reading in Greek for grade 2 specifically, while Diamanti et al. (2018) found this to be the case for grade 1. Because Greek maps three specific vowels, i.e. /o/, /e/, /i/, with ten different grapheme alternatives, word morphological awareness helps Greek speakers to realise how these are formed and contributes to better spelling skills.

More specifically, Desrochers et al. (2018) looked at three languages varying in orthographic consistency, i.e. French, English and Greek. This focus on orthography is important because in languages like Greek with a not so transparent orthography, where phoneme-to grapheme correspondences are less regular than grapheme-to-phoneme correspondences (as opposed to Finnish or Dutch), morphological awareness can make a difference to children's spelling skills. The authors expected that morphological awareness would predict the children's literacy development differently based on the orthographic consistency of each language. The children, aged about 7;5 years old, were assessed at the beginning of grade 2 through morphophonological awareness tasks (phoneme elision with words and non-words, word analogy and sentence analogy, and word production) and rapid automatised naming (colour and digit naming), and at the end of grade 2

through reading accuracy, fluency and comprehension, and spelling to dictation tasks. There were two sessions of 30 minutes each.

Multi-group analyses showed that the relations between morphological awareness and literacy outcomes were not significantly different across languages despite the fact that morphological awareness was a unique predictor in all three languages for reading comprehension and spelling. This supports the authors' prediction that morphological awareness is useful for spelling when phoneme-to-grapheme relations are constructed inconsistently, while the former also benefits reading comprehension because being aware of morphemes raises awareness of word meaning and sentence processing. Morphological awareness was also a predictor for reading fluency in English and French and reading accuracy in English only, which means that reading fluency and accuracy in early school years are language specific.

Diamanti et al. (2018), who looked at the development of morphological awareness in Greek children between 4 and 7 years of age (pre-kindergarten to first grade), focused on the distinction between epilinguistic and metalinguistic awareness to see whether the production of inflectional and derivational morphemes follows distinct paths. There were four morphological tasks, two for judgement and two for production of inflectional and derivational morphemes. Any signs of morphological awareness in the pre-school years were considered to be an indication of metalinguistic skill

acquisition based on spoken language experience, given that these children were not yet exposed to any formal instruction.

There seemed to be a developmental progression in Greek morphology during this specific age range, as performance increased significantly with age in all tasks. The children were capable of manipulating nominal number agreement and present tense verbs. However, production of derivational morphemes was consistently more difficult than production of inflectional morphemes or judgement of derivational morphemes. Thus, performance in derivational morphology was linked to task challenge, with production being more difficult than judgement. Although the youngest children showed some awareness of derivational morphology, this seems to develop more at around 6 years old. Nonetheless, Greek children seem to benefit from their morphologically rich language to the point that they manage to produce morphemes before they receive any formal instruction, while they also seem to benefit from the incorporation of certain instructional activities in kindergarten.

Rothou and Padeliadu (2015) had a similar finding with Desrochers et al. (2018). They looked at how verb inflection and noun-adjective inflection contributes to word reading and reading comprehension in Greek and to what extent this awareness can contribute to early reading skills. Their sample consisted of first, second and third graders (age range: 6;67-8;64), who were distributed the oral tasks. Even though performance increased by age, not even the oldest group achieved maximum performance in the

overall morpheme production, with verb inflection being more difficult than noun-adjective inflection. Thus, it could be the case that the more complex a language is the more time it takes for morphological awareness to develop. However, noun-adjective inflection awareness contributed to word reading in grade 1 (to a certain extent), which indicates that Greek-speaking children possess some knowledge by the time formal instruction starts (see also Diamanti et al., 2018). Rothou and Padeliadu also found that morphological awareness at the end of grade 2 predicted reading comprehension in grade 3 (see also Pittas and Nunes, 2014, later in this section).

There have hardly been any intervention studies with young children whose morphological awareness has been raised in order to see whether this influences their early literacy skills (see Tsesmeli, 2009, published in Greek, on the improvement of spelling in the sixth grade after a morphological awareness intervention). Manolitsis (2017) is the other study who looked at whether morphological awareness instruction in Kindergarten contributes to the improvement of young children's early literacy skills (from 4 to 6 years old), such as morpho-phonological awareness, print knowledge and vocabulary. Manolitsis conducted two studies both of which received a five-week intervention, with the difference that study 2 consisted of a larger sample and received both morphological and phonological awareness activities. This intervention focused on teaching morphemes, which are not part of the mainstream literacy activities of the national curriculum, by teaching morphological problem-solving skills and how to detect morphemes in spoken words.

The groups that received morphological awareness or blended (morphological and phonological) instruction improved their abilities on the production of word forms and the formation of compounds more than the control group did, while only the group that received blended instruction showed some improvement on phonological awareness. The control and morphology groups did not show any significant differences in their performance on the phonological awareness tasks. In other words, the inclusion of morphological awareness tasks along with other measures of early literacy skills seems to contribute to the development of these early literacy skills.

Koromvokis and Kalaintzidis (2013) tested 120 monolingual Greek-speaking children on their ability to recognise the gender of a noun and establish the agreement accompanying it. Their aim was to determine how important morphosyntax and semantics are in identifying the gender of a noun. The authors added the children in two groups: the younger group in the 1st grade at the time (6 years old) and the older group in the 5th grade at the time (10 years old). The materials included non-words and coloured drawings of imaginary creatures, and the children were asked what the drawings represented after being provided with input through practice.

Findings revealed that Greek children pay more attention to intralinguistic (morphosyntax) than to extralinguistic (semantics) information; the older group outperformed the younger group. This is indication that grammatical gender is based on the characteristics of the language and it is probably not

linked to an understanding of the natural gender. Nonetheless, it is worth pointing out that even though Greek children start using gender early on, they still encounter challenges due to the numerous inflectional categories and the overlapping of cases. This explains why the older group performed better than the younger group, since older children are more familiar with these issues in the language and know how to distinguish and use them more correctly.

Finally, Pittas and Nunes (2014) also looked at the relation between morphological awareness and reading and spelling in Greek (longitudinal study) and whether this connection is independent of IQ and phonological awareness, as well as initial literacy score (in grade 1, as opposed to grades 2 and 3). These measures have not been included in past studies, making this research unique in looking at reading development beyond the initial phases of learning to read, after having controlled for the aforementioned measures. The sample consisted of 404 children, aged 6-9 years, in order to examine the above at two different points in literacy development Pictures were presented on a computer screen through phonological and morphological awareness tasks. The morphological awareness measures included judgment of pseudo-word inflection, a sentence analogy task and a morphological relatedness task, while the outcome measures included a standardised spelling test, a morphological spelling test and a reading test.

Findings showed that morphological awareness made a unique contribution to the prediction of reading and spelling in Greek. It specifically predicted

reading performance after eight months (there were two phases of data collection with an 8-month interval). Thus, the children progressed significantly in the measures of morphological awareness during the interval. This progress remained significant as the children progressed in their literacy skills, as the correlations between the children's performance at Time 1 in morphological awareness measures and each of the measures of reading and spelling at Time 2 were significantly positive, after having controlled for grade, verbal ability, phonological awareness and initial reading level.

In what follows next, I outline a more detailed account of agreement in L2 Greek among children and adults. I focus specifically on the studies of Konta (2012, 2013) and those of Clahsen and colleagues (Clahsen et al., 2010; Stavrakaki and Clahsen, 2009) because I have used part of their materials and methodology in order to design my own experiments.

4.3.1 Agreement in Late Child Greek L2

Konta (2012a) investigated both gender assignment and gender agreement in L2 Greek of children of different proficiency levels. She wished to investigate a number of hypotheses. Firstly, she argued that native speakers of Greek would be more accurate than child L2 learners. Secondly, the more proficient L2 learners would outperform the less proficient ones. In the case that the L2 learners had acquired the target morphology but have issues on establishing connections between adjectives and nouns, they would perform better on gender assignment than on gender agreement.

Konta also investigated Anastasiadi-Simeonidi and Chila-Markopoulou's (2003) theory on semantic prototypicality. When nouns are prototypical with respect to gender, morphological and semantic cues coincide, meaning that natural and grammatical gender are the same (e.g. *o psilós ándras* 'the tall man' [+masculine, +animate male]). In a language like Greek, where there is a tripartite gender distinction, grammatical and natural gender either coincide or clash. There are both inanimate neuter nouns (semantically prototypical because morphology and semantics coincide, e.g. *to ghrafío* 'the desk' [+neuter, +inanimate]) and animate neuter nouns (semantically non-prototypical because morphology and semantics clash, e.g. *to korítsi* 'the girl' [+neuter, +animate female]). There are also inanimate masculine and feminine nouns (semantically non-prototypical, e.g. *o kouvás* 'the bucket' [+masculine, +inanimate]; *i pórta* 'the door' [+feminine, +inanimate]), and animate masculine and feminine nouns (semantically prototypical, e.g. *o ándras* 'the man' [+masculine, +animate male]; *i ghinéka* 'the woman' [+feminine, +animate female]). Konta argued that the L2 learners would perform better on semantically prototypical nouns, i.e. when grammatical and natural gender coincide. Finally, she also predicted that semantic prototypicality would play a more important role in gender agreement than in gender assignment because coincidence in grammatical and natural gender will facilitate agreement between the adjective and the noun.

Konta tested 41 native speakers of Greek and 125 Turkish-speaking learners (12 to 14 years of age) in two offline tasks for gender assignment and gender agreement respectively. Level of education or literacy were not specified in

this study. However, the L2 learners' proficiency levels were measured through a written proficiency test *Let's Speak Greek III* (Tzevelekou et al. 2003). In the gender assignment task, the participants were exposed to nouns through pictures, while the target noun and the three forms of the definite article were provided in writing (see Figure 4.1). Thus, participants were exposed both to the visual and the written mode, while they were tested orally. The participants' task was to assign the correct definite determiner.

o / i / to ombrela [umbrella]

Figure 4-1 Example from the gender assignment task (Konta 2012a)

In the gender agreement task, the participants were exposed to the same objects, which differed this time in terms of a property, such as size or colour. The researcher asked a question for each picture and participants had to describe the circled object through the use of an adjective (see Figure 4.2).

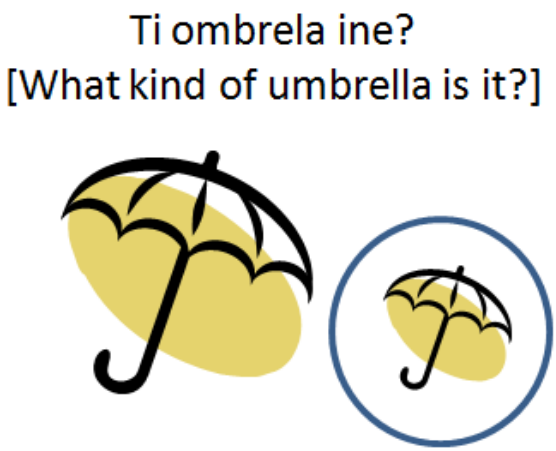

Figure 4-2. Example from the gender agreement task (Konta 2012a)

Results showed that the native speakers performed at ceiling in both assignments, while performance increased with increased proficiency level. Advanced learners had higher accuracy than the all other L2 groups (94.6% in gender assignment and 77% in gender agreement). The high and the low-intermediate groups scored higher than the beginner group (high-intermediate: 77.6% in gender assignment and 58.9% in gender agreement; low-intermediate: 71.8% in gender assignment and 51.7% in gender agreement; beginners: 59.3% in gender assignment and 44.7% in gender agreement). One-way ANOVAs showed a main effect of group for both the assignment (*F (4,161) =74.47, p=0.00*) and the agreement (*F (4,161) =196.83, p=0.00*) tasks. These results also showed that gender agreement is more challenging than gender assignment with all groups performing better on the latter (beginners: *t* (32) =5.89, *p*=.000; low-intermediate: *t* (39) =11.34, *p*=.000; high-intermediate: *t* (27) =8.14, *p*=.000; advanced: *t* (23) =7.29

p=.000; native speakers: *t* (40) =4.02, *p*=.000). Thus, the L2 learners acquired gender specifications but still experienced mapping-accessibility issues regardless of proficiency level.

With respect to the theory of prototypicality, participants were tested on all three genders both on semantically prototypical and non-prototypical nouns. In gender assignment, all learners except for the advanced group (*t (23) =1.93, p=0.06)* performed better on semantically prototypical than on semantically non-prototypical nouns (beginners: *t (32) =7.18, p=0.00*; low-intermediates: *t (39) =8.33, p=0.00*; high-intermediates: *t (27) =6.52, p=0.00*).

With respect to endings, all learners except for the advanced group had low scores on the following, especially on semantically non-prototypical nouns: masculine *–is,* beginners: 36%; low-intermediates: 48%; high-intermediates: 63%; feminine *–I*, beginners: 52%; low-intermediates: 57%; high-intermediates: 62%;, and neuter *–I*, beginners: 48%; low-intermediates: 48%; high-intermediates: 61%, and *–ma*, beginners: 50%; low-intermediates: 48%; high-intermediates: 67%. There was a main effect of ending for all L2 learners (beginners: *F (4.39, 140.52) =6.96, p=0.00*; low-intermediates: *F (3.68, 143.50) =17.88, p=0.00*; high-intermediates: *F (4.05, 109.40) =4.67, p=0.00*; advanced: *F (1.67, 38.45) =4.73, p=0.02).* Konta's hypothesis that the learners would perform better on semantically prototypical nouns, i.e. when grammatical and natural gender coincide, was supported by the findings.

All groups performed better at semantically prototypical than at non-prototypical nouns during gender agreement (beginners: *t (32) =9.44, p=0.00*; low-intermediates: *t (39) =21.14, p=0.00*; high-intermediates: *t (27) =17.71, p=0.00*; advanced: *t (23) =6.75, p=0.00*; native speakers: *t (40) =4.19, p= 0.00*). There was also a main effect of ending for all groups (beginners: *F (3.43, 109.82) =19.53, p=0.00*; low-intermediates: *F (2.59, 101.17) =28.15, p=0.00*; high-intermediates: *F (3.16, 85.25) =13.81, p=0.00*; advanced: *F (3.22, 74.11) =3.26, p=0.02;* native speakers: *F (7,280) =7.93, p=0.00*). The L2 learners performed better in gender assignment than in gender agreement because gender representations have not yet been acquired. Main effects of type of ending and semantic prototypicality were found. There were bigger differences in the gender agreement task between semantically prototypical and non-prototypical nouns, indicating that morphology and semantics play a bigger role in the accuracy of gender agreement.

4.3.2 The Role of the Intensity of Input in Gender Assignment and Gender Agreement

As part of her PhD thesis, Konta (2013a, 2013b) also looked at the role of input in gender assignment and gender agreement. This time, she tested the advanced child group. One group of students had attended a Greek primary school, where all of the subjects were taught in Greek (intensive input). The other group had attended a minority primary school, where half of the subjects were taught in Greek and half in Turkish (non-intensive input). The researcher implemented the same methodology as before. One added

prediction was that if the intensive-input group scored higher than the non-intensive input group, intensity of input would play an important role in child L2 acquisition.

The intensive-input group performed better than the non-intensive group in both tasks (gender assignment: *U = 107.50, p=0.00*; gender agreement: *U = 105.00, p=0.00*), while both groups performed better in gender assignment than in gender agreement (*T = 0, p=0.01* and *T = 0, p=0.00* respectively). However, there was a bigger difference in accuracy for the non-intensive input group (*U = 23.50, p=0.02)*. With respect to the two linguistic variables during gender assignment (semantic prototypicality and type of ending), a related-Samples Friedman's ANOVA showed that there was a main effect of ending for the non-intensive input group (χ^2 (7, *N* = 15) = 21.87, p = 0.00). As expected, the non-intensive input group also performed significantly better on semantically prototypical nouns (*T* = 3.50, p = 0.01). No differences occurred for the intensive-input group.

It seems that exposure and amount of input received play an important role in child L2 acquisition with respect to gender, since the performance of the intensive-input group had more similarities with that of the native speakers' group. Finally, intensity of input seems to influence performance more than the acquisition of gender specifications, as the effect was larger for gender agreement than for gender assignment (*r =0.84* and *r =0.54* respectively).

4.3.3 Agreement and Input-based Instruction

Agathopoulou et al. (2008) investigated the acquisition of adjective-noun agreement (e.g. ***o*** *prássin**os*** *kíp**os*** 'the green garden') by adult learners of low-intermediate L2 proficiency in Greek based on the effect of input-based instruction. The researchers' aim was to investigate this structure with adult L2 learners of low proficiency in Greek in order to find out what types of errors these learners make in grammatical agreement. In addition, learners were exposed to two types of input-based instruction, namely 'Processing Instruction' and 'Focus on Form', in order to examine their effect on the acquisition of agreement. The researchers wished to find out whether the two different types of instruction affected errors in a different way.

Input-based instruction is an approach where the input to which the learners are exposed or required to process is manipulated (Ellis 2012). One of the ways to manipulate it is through 'Processing Instruction' (VanPatten 1996, 2004). The aim of Processing Instruction is to enhance learners' processing strategies between form and meaning in order to ensure more intake, while the 'Focus on Form' approach deals with meaningful communication through tasks that guarantee that chances to use the target structure will arise (Doughty and Williams 1998b).

The participants were adult L2 learners with less than a year's stay in Greece. They had different L1 backgrounds, the majority of which included gender agreement as a grammatical feature except for two languages, English and Thai. The participants had already received 100 hours of

intensive instruction in Greek, including explicit instruction of the target feature. They were tested orally through an oral elicited imitation task and in writing through two written production tasks (controlled and semi-controlled). Although they received schooling in the L2, their L1 literacy or educational level were not specified.

The researchers met with the participants three times. In the first visit, participants were tested in gender agreement through the tasks. In the second visit, they were divided into two groups: one where participants were taught gender agreement through 'Processing Instruction' and another through 'Focus on Form' activities. Both groups were given similar vocabulary. However, in the 'Processing Instruction' group, the participants were not given any information on the rules, while in the Focus on Form group there was explicit focus on morphology by printing in bold and red the agreement suffixes in both adjectives and nouns (textual enhancement). Finally, the third visit took place two weeks after the teaching session and both groups undertook the three tasks once more.

In the controlled written production task, slides with pictures were used as stimuli for the elicitation of the target adjectives, while participants were tested in nouns in all three genders. In the second semi-controlled written task, participants had to describe two pictures that contained the same objects but differed in terms of colour, size or both. In the oral elicited imitation task, participants were exposed to 36 grammatical and

ungrammatical sentences with adjective-noun agreement. Their task was to listen to the recorded sentence and repeat.

In the controlled written production task, both groups produced more accurate responses after having received instruction (Processing Instruction: 18% more accurate; Focus on Form: 18.5% more accurate). This improvement was statistically significant (Processing Instruction: *z = 2.524, p = 0.01*; Focus on Form: *z = 2.527, p = 0.01*). The most common errors concerned the overgeneralisation of the neuter suffix *–o* and phonological matching of the noun ending with the adjective ending. 'Focus on Form' instruction was more effective than 'Processing Instruction', as it improved significantly in the post-test regarding the overgeneralisation of *–o* (χ^2 = 9.726, *p = 0.00*). Furthermore, in an additional analysis, performance was compared based on items with homophonous suffixes (match condition, e.g. *prásino mílo* 'green apple') and non-homophonous suffixes (mismatch condition, e.g. *psiló mathití* 'tall student'). Both groups improved significantly in the post-test of the match condition (Processing Instruction: *z = 2.527, p = 0.01*; Focus on Form: *z = 2.252, p = 0.02*). However, only the 'Focus on Form' group improved significantly in the post-test of the mismatch condition (Processing Instruction: *p > 0.1*; Focus on Form: *z = 2.313, p = 0.02*).

In the semi-controlled written production task, all participants produced significantly more accurate than erroneous responses (χ^2 =136.013, *p = 0.00*), while none of the two groups exhibited any significant differences in performance. In the oral elicited imitation task, both groups produced more

accurate responses in the post-test than in the pre-test (Processing Instruction: 10% more accurate; Focus on Form: 21% more accurate). This difference in performance was statistically significant (Processing Instruction: *z = 2.530, p = 0.01*; Focus on Form: *z = 2.524, p = 0.01*). Phonological matching was the main type of error in both the pre-test (Processing Instruction: χ^2 =32.287, *p = 0.00*; Focus on Form: χ^2 =29.070, *p = 0.00*) and the post-test (Processing Instruction: χ^2 =27.000, *p = 0.00*; Focus on Form: χ^2 =14.297, *p = 0.00*).

With respect to grammaticality, both groups performed better on the grammatical than on the ungrammatical sentences in the pre-test (Processing Instruction: *z = 2.388, p = 0.02;* Focus on Form: *z = 2.371, p = 0.02*) and in the post-test (Processing Instruction: *z = 2.527, p = 0.01;* Focus on Form: *z = 2.058, p = 0.04*). Although both groups improved in the post-test, only the Focus on Form group improved significantly on both the grammatical (*z = 2.441, p =0.01*) and the ungrammatical items (*z = 2.553, p =0.01*).

Overall, both groups performed better in the post-test in all tasks. However, the 'Focus on Form' group was better than the 'Processing Instruction' group. Instruction had an effect on error types, which changed in the post-test. Learners made less generalisations of the neuter suffix *–o* and more in phonological mathing. However, these changes were statistically significant only for the 'Focus on Form' group. The explanation of the significantly improved performance of the 'Focus on Form' group might be that noun

accompanied by adjectives and enhanced with textual enhancement techniques contribute to better intake.

4.3.4 The Influence of the L1 in L2 Morphosyntax

There is not a great deal of studies regarding number agreement in L2 Greek. Andreou et al. (2008) studied L2 Greek morphosyntax, namely plural markers and word order with native speakers of English residing in Greece. The aim of the study was to find out whether the errors the L2 learners made were due to morphology, syntax or both, always in relation to their L1. The researchers predicted that the simpler word order and morphology of English would interfere with the learners' acquisition of these two structures.

There are fundamental differences between the two languages. Greek morphology is complex and carries meaning, while English morphology tends to be simpler with meaning not being affected by morphological errors (e.g. **She like going to the cinema* instead of *She likes going to the cinema*). Since nouns and verbs in Greek are marked for person, gender, number, and tense, word order tends to be freer than the strict word order that characterises the English language. In the latter's case, it is syntax that conveys meaning, not morphology.

The participants were 30 Greek-speaking, and 30 English-speaking high school students, who had attended a Greek school in Greece for four years at the time of the study. Response time played a crucial role in this study, as both tasks were timed. With regards to the morphology task, participants

were exposed to 30 words in total. First, a singular noun appeared on a computer screen for one second, followed by a plural noun for 1.5 seconds. The participants' task was to press '1' for correct and '2' for incorrect as quickly as possible. Similarly, participants were exposed to 30 sentences in total for the syntax task. A short sentence would appear for 2.5 seconds. Their task was to press a key as quickly as possible, based on their belief of the correctness of the word order.

A mixed-design 2 (language: Greek vs English) x 2 (task: morphology vs word order) x 2 (sex: female vs male) ANOVA showed a main effect for language ($F\ (2000)$ = 38.706, $p < 0.05$) and task ($F\ (2000)$ = 28.224, $p < 0.05$) but not for sex. However, there was a significant interaction of sex with language ($F\ (2000)$ = 4.195) and task ($F\ (2000) = 5.784$). There was a main effect for errors and reaction time for type of task (reaction time: $F\ (1)$ = 32.563; errors: $F\ (1)$ = 23.572), meaning that learners made less errors and were faster in the word order task.

Overall findings supported part of the researchers' predictions. With respect to English-speaking high school students, who have received formal education in Greece, results showed that free word order in Greek acts as a facilitator simply because these L2 learners do not have to learn a new strict word order. On the contrary, they faced difficulties in learning the variety of plural markers in Greek. The researchers concluded that native speakers of languages like English face difficulties when the L2 features that they

encounter are more complex than the relevant features in their own language (morphology in this case).

4.4 Conclusion

Overall, Greek has a complex inflectional system. As the aforementioned studies show, learners of Greek find the acquisition of morphology challenging, especially those whose L1 is characterised by a simpler inflectional system. In other words, the L1 seems to act as an inhibitor when it lacks a feature that the learner is trying to learn in the L2. It also seems, though, that instruction, especially the type where attention is drawn explicitly to form, and intensity of instructional input contribute to the better learning of morphology. However, not all L2 learners are highly educated, nor do they have access to instruction in order to ensure more accurate acquisition of the L2. This means that they learn the L2 without being exposed to text, while they can only rely on the input that they receive from interactions with other speakers of the L2. For these reasons, in the next chapter, I present the findings of Experiment 1, where learners of Greek were taught agreement implicitly through different modalities.

Chapter 5 – Experiment 1

Methodology, Results and Discussion

5.1 Introduction

In this chapter, I introduce Experiment 1, an intervention study, where native speakers of English were taught and tested on singular agreement in L2 Greek. The overall aim of Experiment 1 was to identify in what way the presence or absence of alphabetic print would affect the accuracy of the production of L2 oral skills. This tested a certain part of the *Noticing hypothesis* and the learner selective attention theory, in that, text would enhance the learners' noticing skills by increasing the salience of the inflectional cues. As a consequence, text would contribute to the production of more accurate output.

To achieve the above, I created two groups 1) visual and auditory, and 2) auditory. Thus, Experiment 1 was a cross-modal study, where one group was exposed both to the visual (text) and to the auditory (audio) mode ('text group'), whereas the other group was only exposed to the auditory mode ('audio group'). That is to say, the text group was exposed to the target structure through image, sound, and text, while the audio group was only exposed to image and sound.

The two groups were also tested in condition (trained and untrained) in an immediate (time 1) and a delayed post-test (time 2) Therefore, there were three IVs: group (text vs. audio), condition (trained vs. untrained), and time

(time 1 vs. time 2). In the analysis, ‘1’ was equal to ‘text group’ and ‘2’ to ‘audio group’. The DVs were the percentages of correct responses in vocabulary, determiner-noun agreement, and adjective-noun agreement responses at times 1 and 2.

I predicted the following:

1. the text group would outperform the audio group in its oral production by paying more attention to form due to exposure to text. More specifically, I predicted that the text group would be more successful in its speech production by producing responses that were more accurate.
2. The text group would outperform the audio group in its ability to generalise the trained condition. Exposure to print increases the learner’s chances to apply what was learned on new items by creating a link between trained and untrained items based on what the learner visualised during the training. Having visualised the sounds of the target language through text would lead to more accurate generalisations of the trained condition.
3. Both groups’ performance would drop a week after training in the delayed post-test, with the audio group presenting a larger gap in its performance from time 1 to time 2.

In this chapter, I present the methodology, results and discussion of Experiment 1. I outline the research approach and design including the participants, the materials, procedures, coding process and data analysis

approach. I then present the results and subsequent discussion on the findings of Experiment 1.

5.2 Research Approach and Design

Experiment 1 was designed through the free, cross-platform experimental software OpenSesame (Mathôt 2012). Experimental research, and specifically computer technology, allows for control of the variables and for the reliable testing of specific structures. It also allows for replication and increases the internal validity of the study (Rosa and Leow 2004a). The main reason for choosing a computer programme to teach and test Greek was to allow for individual sessions, which make participants feel more independent, engaged and at ease when learning a new language (Motteram 2013). In this experiment, participants were taught singular agreement implicitly. They were told that they would learn Greek through various, fun computer tasks and that they would have the chance to practice.

I met with each participant twice. The first session consisted of training and testing, and lasted approximately one hour and fifteen minutes (time 1). The second session consisted of testing only and lasted approximately fifteen minutes, and it took place a week later (time 2). Time was one of the IVs in the data analysis process. The sessions consisted of various activities, such as repetition, questions, picture-selection, and speech production; the rest of this section includes detailed information on these activities. The teaching session (training, henceforth) comprised six tasks out of which four were for learning singular agreement and two for practice. The idea was for the

learners to have enough exposure to the items by listening and repeating several times before testing their comprehension through practice. Training and testing was the same for both groups with the only difference being that the audio group was not exposed to any text as opposed to the text group. Thus, both groups did the tasks described from this point onward with the exception that there was no text in the activities for the audio group.

In Task 1, the participants were simply exposed to noun phrases consisting of a definite article (e.g. *i* 'the.FEM') and a noun (e.g. *karékla* 'chair.FEM') (see Figure 5.1). The aim was to start familiarising the learners with the determiner and the noun (for a full list of the items of Task 1, see Appendix B, Table B1).

Figure 5-1. Example of Task 1 – i karékla 'the chair'

In Task 2, the participants were exposed to the same phrases as in Task 1, with the difference that they were asked to repeat after each phrase in order to practice their oral production. In Task 3, participants were exposed to two

questions in Greek, which helped them to understand what the phrases in the two previous tasks meant. Question 1 (*Ti íne aftó?* 'What is this?') was followed by a single noun as the answer (e.g. *kádhos* 'bin') (see Figure 5.2).

Figure 5-2. Example 1 of Task 3 – Ti íne aftó? 'What is this? –Kádhos 'Bin'

Question 2 (*Ti hróma íne o/i X?* 'What colour is the X?' where 'X' corresponded to a different noun each time) was followed by the corresponding colour adjective as the answer (e.g. *mávros* 'black') (see Figure 5.3 below).

Figure 5-3. Example 2 of Task 3 – Ti hróma íne o kádhos? 'What colour is the bin? –Mávros 'Black'

In the final step of Task 3, participants were given the whole noun phrase containing a determiner, an adjective, and a noun (e.g., *o mávros kádhos* ‘the black bin’) (see Figure 5.4).

Figure 5-4. Example 3 of Task 3 – o mávros kádhos ‘the black bin’

Task 4 helped the participants to practice by testing their comprehension. The participants were exposed to the same noun phrases as in Task 3. They heard the target noun phrase (in writing, only for the text group) and had to choose between two pictures of the same object but of a different colour (e.g. *i kóqini aposqeví* ‘the red suitcase’) (see Figure 5.5).

Figure 5-5. Example of Task 4 – i kóqini aposqeví ‘the red suitcase’

In Task 5, the participant listened to the noun phrases again and was simply asked to repeat after each phrase.

Finally, in Task 6, the participant had to choose between two different objects of the same colour. Similar to Task 4, the participant heard the target phrase and had to choose between the two items (e.g. *i mávri bloúza* 'the black blouse') (see Figure 5.6).

Figure 5-6. Example of Task 6 – i mávri bloúza 'the black blouse'

Next, the participant was provided with the correct answer (see Figure 5.4), and was asked to repeat after each phrase. Thus, by the end of the training session, the participants had several opportunities to produce the target noun phrases through repetition.

Table 5.1: Summary of Experiment 1 computerised tasks on Greek singular agreement-Training session

Task 1	Exposed to noun phrases consisting of a definite article and a noun (e.g. *i karékla* 'the chair').
Task 2	Exposed to the same noun phrases; learners repeated after each item.
Task 3	Exposed to two questions:

	Q1: *Ti íne aftó?* 'What is this?' Answer: the target noun (e.g. *karékla* 'chair'). Q2: *Ti hróma ine o/i X?* 'What colour is the X?' Answer: the corresponding colour adjective (e.g. *mávri* 'black') Final step: the whole noun phrase is provided (e.g. *i mávri karékla* 'the black chair')
Task 4	Comprehension tested through practice; exposed to the noun phrases from Task 3. Learners choose between two pictures of the same object but of a different colour (see fig. 5.5)
Task 5	Listened to the noun phrases from Task 4 and repeated.
Task 6	Practice: learners choose between two different objects of the same colour (see fig. 5.6). The correct answer is provided. Learners repeated the noun phrases.

The testing session consisted of three computerised comprehension tasks of picture-selection, and one task of oral production. The participants were not exposed to any text during the testing session. In Task 1, the participants were tested in their comprehension of the noun phrases consisting of a determiner and a noun. In Tasks 2 and 3, they were tested in noun phrases consisting of a determiner, an adjective and a noun (for a full list of the testing items of Tasks 2 and 3, see Appendix C, Tables C1 and C2 respectively). In Task 3, the participants' comprehension was also tested through items that were not included in the training (untrained items). In other words, the participants were exposed to the same vocabulary but to

combinations of adjectives and nouns for which they had not received any training. For instance, if they were taught the noun phrase ‘the black wall’, the untrained item was ‘the red wall’. Figure 5.7 below is representative of the three testing tasks, where participants were not exposed to any text.

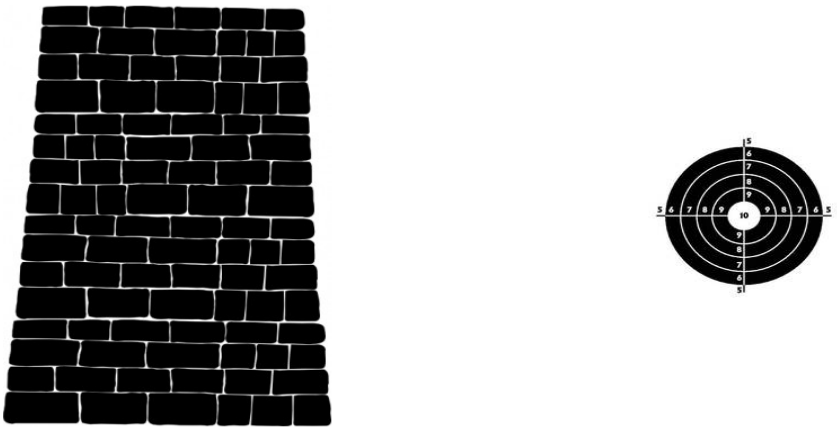

Figure 5-7. Example of the Computerised Testing Tasks of Experiment 1

In the fourth non-computerised task, the participant had to interact with me, the researcher. I used the two questions from practice Task 3 (see Figures 5.4 and 5.5) in order to test their oral production (for a full list of the testing items of the oral production task, see Appendix D). The participants had to answer the two questions (e.g. ‘What is this?’ and ‘What colour is the chair?’) by looking at printed pictures of the objects; their answers were recorded in the answer sheet. The second testing session took place a week after, where the participants took the three computerised tasks and the oral production task with the researcher.

Table 5.2: Summary of Experiment 1 tasks on Greek singular agreement-Testing session

Task 1 (computerised)	Tested comprehension of noun phrases consisting of a determiner and a noun through picture selection.
Task 2 (computerised)	Tested comprehension of noun phrases consisting of a determiner, an adjective and a noun through picture selection.
Task 3 (computerised)	Tested comprehension of noun phrases consisting of a determiner, an adjective and a noun, for which learners received no training (untrained items).
Task 4	Non-computerised task, through interaction with the researcher. Learners were asked the two questions from Task 3 of the training session (see Table 5.1). They answered the two questions with the help of printed pictures.

5.2.1 Participants

Forty-six (46) adult native speakers of English (26 females and 20 males) participated in Experiment 1. Each group consisted of 23 randomly assigned participants. The only requirements were that the participants be native speakers of English with no prior knowledge of Greek. The rationale was to look at whether native speakers of a language with a relatively impoverished morphology would be able to attend to form and whether print would facilitate that. The mean age was 29.3 years for the text group and 31.3 years for the audio group, while the mean full-time education was 16.8 years for the text group and 16.6 years for the audio group. Data collection took place between

2016 to 2017 in the wider area of Newcastle upon Tyne, UK. All of the participants were informed of their rights and provided their written consent.

5.2.2 Materials

The materials were selected after careful consideration of the following:

- Representative Inflectional Classes of both masculine and feminine nouns: the endings of the target items were the most common endings for the two genders in order to ensure that the learners would be exposed to the most frequent and regular inflections in the L2.
- All items were inanimate nouns: It was easier for the learners to focus on inanimate nouns only and on one property, i.e. colour. The time these learners had to learn the target items was not enough in order to test them on animate nouns and other possible properties, such as size or age.
- Equal number of syllables in nouns to ensure that no difficulties in performance would occur due to differences in the phonological length of the words.
- Frequently occurring nouns to ensure that low frequency would not interfere with learner performance.
- Two colour adjectives suitable for all nouns: ‘red’ and ‘black’ were found to be appropriate for all the items. The addition of too many adjectives would increase the number of testing items to the point of creating an excessive cognitive load for these beginner learners.

Eight masculine nouns ending in *-os* and *-as*, and eight feminine nouns ending in *-i* and *-a* were chosen (see Table 5.3). The most frequently occurring suffixes are *-as* for masculine (followed by *–os*), and *–a* for feminine (followed by *–i*) (Mastropavlou and Tsimpli 2011: 37).

Table 5.3 Masculine and feminine nouns for Experiment 1

Masculine		**Feminine**	
*kádh-**os***	'bin'	*aposqev-**í***	'suitcase'
*tíh-**os***	'wall'	*thíq-**i***	'case'
*stóh-**os***	**'**target'	*mihan-**í***	'motorcycle'
*dhísk-**os***	'tray'	*klost-**í***	'thread'
*niptír-**as***	'sink'	*bloúz-**a***	'blouse'
*anaptír-**as***	'lighter'	*ghóm-**a***	'eraser'
*élik-**as***	'propeller'	*bál-**a***	'ball'
*hárak-**as***	'ruler'	*karékl-**a***	'chair'

Each noun is preceded by the definite article 'o' for masculine and 'i' for feminine, along with the two colour adjectives *kóqin**os*** ('red' for masculine), *kóqin**i*** ('red' for feminine), and *mávr**os*** ('black' for masculine), *mávr**i*** ('black' for feminine). Similar to the nouns, these endings belong to the most frequent adjectival inflectional class (Holton et al. 2004). The items were sixty-four (64) in total and were presented in a sequential order, except for the practice Tasks 4 and 6 where the order was randomised.

5.2.2.1 Instructions and Items of the Training Session

Training included 6 learning and practice tasks. In Task 1, participants were presented with 16 noun phrases that consisted of a definite article and a noun (e.g. *o kádhos* 'the bin'): eight were in the masculine and another eight in the feminine gender (see Appendix B, Table B1). Participants listened to the noun phrase while looking at the picture; the text group was also exposed to the written version of the noun phrases. The participants' task was to listen and try to understand what the words meant. The items were presented in a sequential order and were repeated three times.

In Task 2, participants were presented with the same noun phrases as in Task 1. Their task was to repeat after each phrase. Similar to Task 1, the training items were presented in a sequential order and were repeated three times.

In Task 3, participants were presented with Questions 1 ('What is this?') and 2 ('What colour is the X?') in Greek (see Figures 5.2 - 5.3). The answers to Question 1 were the words that the participants had learned in Tasks 1 and 2, while the answers to Question 2 were the colour adjectives that were introduced to the participants for the first time at this stage. After the two questions, the whole noun phrase was provided (see Figure 5.4). Table 5.4 below shows the sequential order in which the training items were presented in Task 3.

Table 5.4 Sequential order of training items – Task 3 – Experiment 1

o** mávr**os** kádh**os	the black bin (M)
i** mávr**i** thíq**i	the black case (F)
o** mávr**os** tíh**os	the black wall (M)
***i** mávr**i** mihaní*	the black motorcycle (F)
o** mávr**os** anaptír**as	the black lighter (M)
i** mávr**i** bloúz**a	the black blouse (F)
o** mávr**os** niptír**as	the black sink (M)
i** mávr**i** ghóm**a	the black eraser (F)
o** kóqin**os** dhísk**os	the red tray (M)
i** kóqin**i** klost**í	the red thread (F)
o** kóqin**os** stóh**os	the red target (M)
i** kóqin**i** aposqev**í	the red suitcase (F)
o** kóqin**os** élik**as	the red propeller (M)
i** kóqin**i** karékl**a	the red chair (F)
o** kóqin**os** hárak**as	the red ruler (M)
i** kóqin**i** bál**a	the red ball (F)

The rationale of the order was to expose the learner to all of the items in the black colour, while the items in the red colour were presented next. This order helped the learner to realise that the second word of the noun phrase referred to colour, since the colour of the objects was the only thing that changed as soon as that word changed. The participants' task was to listen to the questions and answers, and try to understand what they meant. There were 16 training items in total.

In Task 4, the participants practiced the noun phrases taught in Task 3 (e.g. *o mávros kádhos* ‘the red bin’). The training items were 16 in total and were presented in a randomised order. The task followed the pattern below (also see Figure 5.5):

		[PIC]	[TEXT]		[PIC]	
E.g.	*o*	*kóqin**os***	*kádh**os***	*o*	*mávr**os***	*kádh**os***
	The	red	bin	the	black	bin

The aim of Task 4 was to test whether the participants realised what the new noun phrases meant. Their task was to match one of the two pictures to what they heard by pressing ‘1’ if they thought what they heard matched the picture to the left and ‘0’ if they thought that what they heard matched the picture to the right. The pictures differed in colour in order to test their comprehension of the colour adjectives.

In Task 5, the participant was presented with the same training items in the same sequential order as in Task 3 (see Table 5.2); the items were repeated three times. The participants’ task was to listen and repeat after each phrase. The aim was to focus on speech production by repeating the whole noun phrase without having any other tasks to do.

In Task 6, the participant practiced the noun phrases similarly to Task 4 through picture-selection (see Figure 5.6). The difference this time was that participants had to choose between two pictures of different objects, as well as repeat the phrase after providing an answer. Next, the correct answer

appeared (see Figure 5.4) and the participant was asked to repeat. By this time, the learners had familiarised with items to the point that they were able to both provide an answer and practice their oral production. The training items were 16 in total and appeared in a randomised order.

5.2.2.2 Instructions and Items of the Testing Session

The testing session consisted of three computerised tasks of picture-selection and one task with the researcher, while text and feedback were not provided throughout testing. Each task ran for one cycle. The testing items were fifty-six (56) in total and were all presented in a randomised order. The instructions for the three comprehension tasks were the same. The participants were presented with two pictures and their task was to match one of two pictures to what they heard. They had to press '1' if they thought that what they heard matched the picture to the left and '0' if it matched the picture to the right.

Each comprehension task had different items. In Task 1, participants were tested on the simple noun phrases that comprised a determiner and a noun (e.g. *o kádhos* 'the bin') (see Appendix B, Table B1). In Task 2, they were tested on previously trained items (e.g. *o mávros kádhos* 'the black bin') (see Appendix C, Table C1), while in Task 3 they were tested on untrained items, i.e. combinations of adjectives and nouns that occurred for the first time (e.g. *i mávri bála* 'the black ball') (see Appendix C, Table C2). This was the first time that the participants were exposed to the untrained items.

Task 4 was an oral production task, and the only non-computerised task, where participants were presented with the printed versions of the objects. I asked the two questions from Task 3 of the practice session, i.e. 'What is this?' and 'What colour is the X?'. The participants' task was to answer every time with what they thought was correct as an answer (see Appendix D).

5.2.3 Procedure

I first administered the required ethics forms, and the participants were given 10 minutes to review the material and complete the personal information section (see Appendix E). Each participant undertook the experiment twice. After the introductory phase, the participants were given general information on how the session would proceed. The sessions were individual and usually took place on Northumbria University campus or at Newcastle City Library. The instructions were provided both orally and in writing before each task. Participants went through each of the six tasks of the practice session. Next, they were tested on the three comprehension tasks. The oral production task was the final task of the testing session, where the participant was given printed pictures of the objects listed in Appendix D. I read the instructions, and the participant's task was to answer the questions learned in Task 3 of the training session (for the 2 questions, see Figures 5.2 and 5.3). The printed pictures were in a randomised order.

The participant repeated the testing session after a week. After being tested on the same comprehension and oral production tasks, the experiment

concluded with an exit questionnaire. The participants' task was to answer the following two questions:

1. Did you notice that the colour words had two different forms?
2. How did you decide which form to choose?

These questions were linked to the *Noticing hypothesis*, and the aim was to identify whether the participants were consciously aware of the morphological changes that took place. Thus, I anticipated that these two questions would reveal any conscious noticing that took place, as well as any metalinguistic awareness that the participants might have with respect to their group. Metalinguistic awareness would be evident by the use of metalinguistic terminology in Question 2 in order to describe any morphological changes.

The first question had two possible responses, 'Yes' and 'No'. Only 'Yes' responses were scored with '1', which indicated that noticing took place. For the second question, two types of learners were detected in the responses: those who chose the colour form based on what they had learned ('1') and those who chose based on the morphological changes ('2'). The latter showed conscious awareness of the morphological changes and the ability to express this awareness verbally through metalinguistic terminology.

5.2.4 Data Coding and Scoring

In all tasks, responses were coded as correct or incorrect (for a detailed description of coding and scoring, see Appendix F, Table F1). The noun

phrases consisted of a determiner, an adjective, and a noun. Correctness of answers was evaluated only when the participants produced speech. In other words, ‘no responses’ were not coded. ‘Vocabulary’ responses were scored as correct when the correct lexical adjective and noun were present. These were calculated by dividing the number of these responses by the total number of testing items.

For the oral production task, I coded determiner-noun agreement and adjective-noun agreement separately. For determiner and adjective agreement to occur, the participant had to produce a determiner or an adjective that agreed in gender with the corresponding noun. Agreement was calculated by dividing the number of phrases containing the correct determiner or adjective agreement by the number of times that an answer was provided plus the number of answers containing incorrect determiner or adjective agreement.

The IVs were group (text versus audio), condition (trained versus untrained) and time (immediate versus delayed post-test), while the DVs were the percentages of correct responses. There were four outcome variables for each type of agreement and two outcome variables for vocabulary responses:

- determiner agreement in the trained condition at time 1;
- determiner agreement in the trained condition at time 2;
- determiner agreement in the untrained condition at time 1;
- determiner agreement in the untrained condition at time 2;

- adjective agreement in the trained condition at time 1;
- adjective agreement in the trained condition at time 2;
- adjective agreement in the untrained condition at time 1;
- adjective agreement in the untrained condition at time 2;
- vocabulary responses at time 1;
- And vocabulary responses at time 2.

Participants received 1 point for each correct response and 'zero' for incorrect responses, whereas 'no response' was scored as 'non-applicable'. The sum of each participant's accuracy score was calculated in Microsoft Excel.

5.2.5 Data Analysis

A series of analysis of variance (factorial ANOVA) was performed to determine differences between groups with accuracy scores as the DVs, and group, condition and training as the IVs. To control for the multiple-comparisons problem, I reported the significant results after running the LSD[13] post-hoc test. All differences were reported as significant at $p<.05$ or higher[14].

The analysis of the oral production task was divided into three parts: Part 1 dealt with the number of correct vocabulary responses, Part 2 with the correct determiner agreement responses, and Part 3 with the correct

[13] *Least Significant Difference.*
[14] An alpha level of .05 is the standard used in research in Language Sciences to reject the null hypothesis, i.e. that the difference in the mean scores is not statistically significant.

adjective agreement responses. The data were analysed through the statistical programme SPSS version 24. What follows next is the results and discussion sections of Experiment 1.

5.3 Results

5.3.1 Comprehension Tasks

The participants were tested on three computerised, comprehension tasks through *OpenSesame*. Task 1 consisted of 16 noun phrases with a determiner and a noun, Task 2 consisted of 8 trained noun phrases with a determiner, an adjective and a noun, and Task 3 consisted of 8 untrained noun phrases with a determiner, adjective and noun. The DVs used in the inferential analysis were the percentages of the correct responses. Table 5.5 shows the mean percentages and standard deviations of the correct responses at times 1 and 2 respectively.

Table 5.5 Mean percentages (and standard deviations) of the correct responses in the three comprehension tasks at times 1 and 2

	Time 1			*Time 2*		
	Task 1	*Task 2*	*Task 3*	*Task 1*	*Task 2*	*Task 3*
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Text group	*100 (0.1)*	*100 (0.3)*	*98 (0.4)*	*99 (0.3)*	*98 (0.6)*	*100 (0.4)*
Audio group	*99 (0.3)*	*100 (0.3)*	*100 (0.3)*	*98 (0.4)*	*98 (0.5)*	*98 (0.4)*

As the table shows, both groups performed at ceiling in all three tasks with a minimum mean of 98%. For Task 1, I ran a 2 (group: text vs. audio) x 2 (time:

time 1 vs. time 2) ANOVA, which did not reveal any significant effect of time (*F (1, 44) =3.070, p=0.09, partial* η^2 *=0.06*) nor was there any significant interaction between group and time (*p=1).* The difference between the two groups was not significant (*F (1, 44) =0.459, p=0.5, partial* η^2 *= 0.01*). This suggests that both groups were able to associate the objects with the target nouns regardless of presence or absence of text, while there was no difference in performance from time 1 to time 2.

For Tasks 2 and 3, I ran a 2 (group: text vs. audio) x 2 (time: time 1 vs. time 2) x 2 (condition: trained vs. untrained) ANOVA. This did not reveal any significant effect of time (*F* (1, 44) = 0.084, *p* = 0.773, *partial* η^2 = 0.002) or condition (*F* (1, 44) = 2.074, *p* = 0.157, *partial* η^2 = 0.045). There were no significant interactions between time and group (*F* (1, 44) = 0.084, *p* = 0.81, *partial* η^2 = 0.00), condition and group (*F* (1, 44) = 1.94, *p* = 0.17, *partial* η^2 = 0.04) or time and condition (*F* (1, 44) = 1.97, *p* = 1.17, *partial* η^2 = 0.04). The difference in performance between the two groups was also non-significant (*F (1, 44) =0.026, p=0.9, partial* η^2 *=0.00*). Therefore, all of the participants seemed to benefit the same from the practice session and were able to understand the target items, before moving to the production task.

5.3.2 Oral Production Task

5.3.2.1 Part 1: Vocabulary Responses

Table 5.6 shows the mean percentages and standard deviations of the participants' correct responses on vocabulary, which consisted of the production of both the adjective and the noun.

Table 5.6. Mean percentages (and standard deviations) of the production of correct vocabulary responses at times 1 and 2

	Text group	*Audio group*
	M (SD)	*M (SD)*
Time 1	*72 (20)*	*66 (19)*
Time 2	*77 (18)*	*71 (14)*

The mean percentages of the text and the audio group at time 1 were 72% and *66%* respectively, while both groups scored higher at time 2 (text group: *M=77%*; audio group: *M=71%*). A 2 (group: text vs. audio) x 2 (time: time 1 vs. time 2) ANOVA revealed a significant effect of time with a large effect size (*F (1, 44) =5.144, p=0.03, partial* η^2 *= 0.105*), while there was no significant interaction between group and time (*F (1, 44) =0.010, p=0.9, partial* η^2 *= 0.00).* There was no significant difference between the two groups (*F (1, 44) =1.410, p=0.2, partial* η^2 = 0.03). Thus, the two groups had a similar performance in vocabulary responses, indicating that training contributed to the acquisition of lexicon to an equal extent for both groups regardless of type of group. In addition, the main effect of time showed that all participants were better at the immediate post-test with respect to vocabulary performance, which supported my prediction that participants would perform better at time 2. Figure 5.8 below provides a visual representation of the two groups' performance on vocabulary both at times 1 and 2.

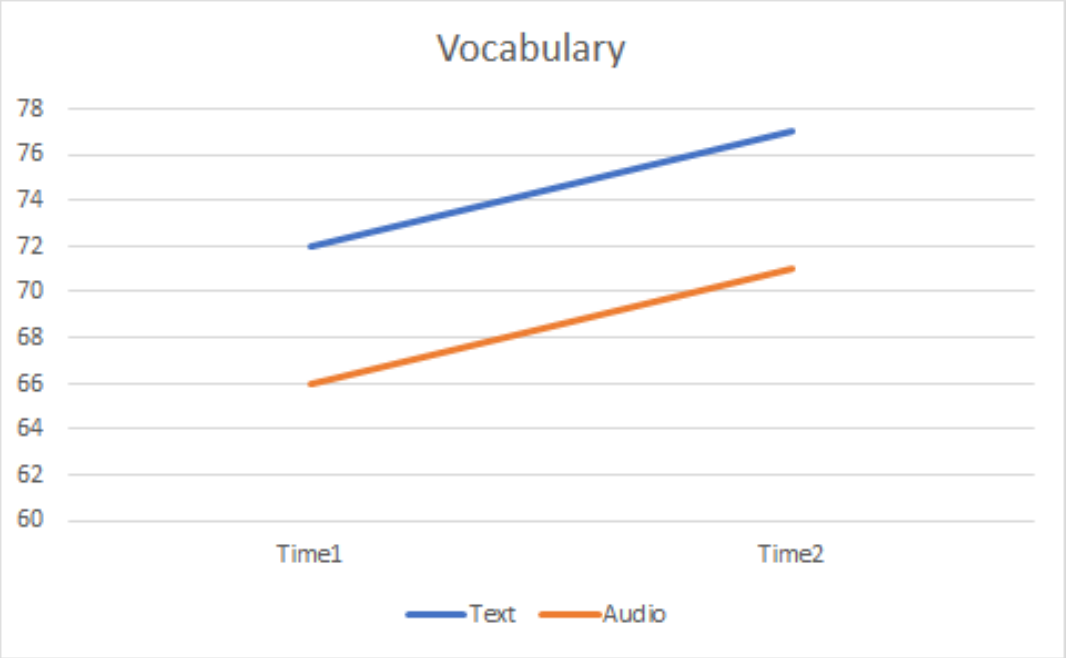

Figure 5-8: Performance of text and audio group on vocabulary responses – Experiment 1

5.3.2.2 Part 2: Determiner Agreement Responses

Table 5.7 shows the mean percentages and standard deviations of the participants' correct responses on determiner agreement, which consisted of the production of both the determiner and the noun.

Table 5. 7. Mean percentages (and standard deviations) of the production of determiner agreement in the trained and untrained conditions at times 1 and 2

	Trained condition		*Untrained condition*	
	Text group	*Audio group*	*Text group*	*Audio group*
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*
Time 1	*15 (14)*	*10 (11)*	*15 (16)*	*7 (8)*
Time 2	*18 (17)*	*11 (14)*	*13 (13)*	*10 (12)*

Findings with respect to determiner agreement were mixed. The mean percentages for trained items at time 1 were 15% for the text group and 10% for the audio group, while both groups scored slightly higher at time 2 (text group: *M=18%*; audio group: *M=11%*). With respect to the untrained items, the text group scored higher than the audio group at both times (time 1: text group *M=15%,* audio group *M=7%;* Time 2: text group *M=13%,* audio group *M=10%).* The text group had the same score at time 1 across conditions (*M*=15%). However, although its score increased at time 2 in the trained condition (*M*=18%), it decreased in the untrained condition (*M*=13%). The audio group had almost the same scores in the trained condition (Time 1: *M*= 10%; Time 2: *M*= 11%). However, it scored slightly higher at time 2 of the untrained condition (Time 1: *M*= 7%; Time 2: *M*= 10%). Figures 5-9 and 5-10 below provide a visual representation of the two groups' performance on determiner agreement of trained and untrained items respectively.

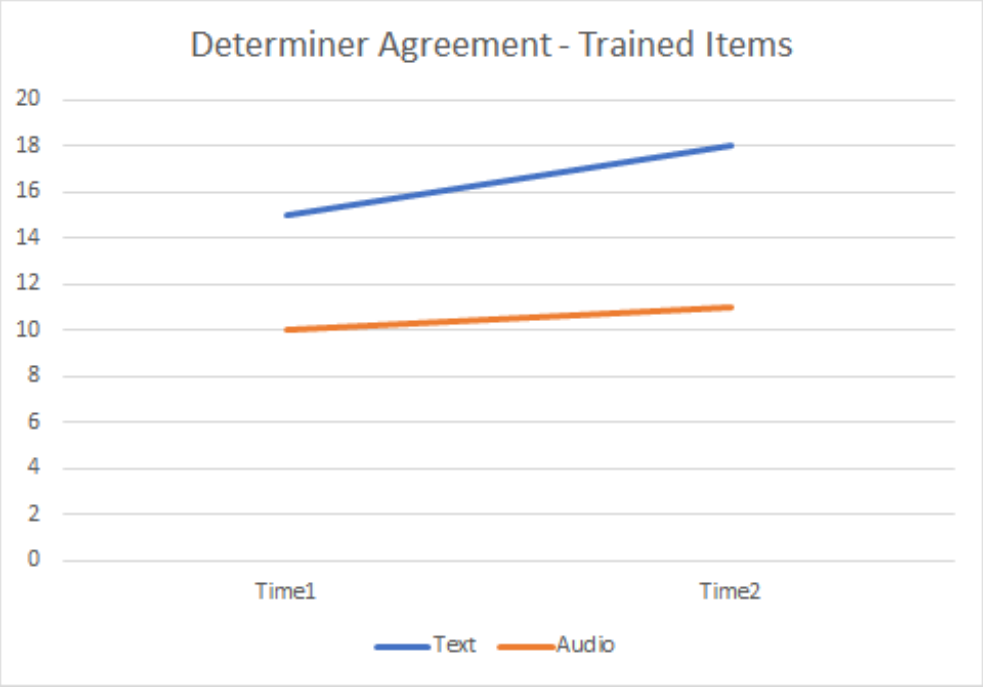

Figure 5-9: Performance of text and audio group on determiner agreement responses of trained items– Experiment 1

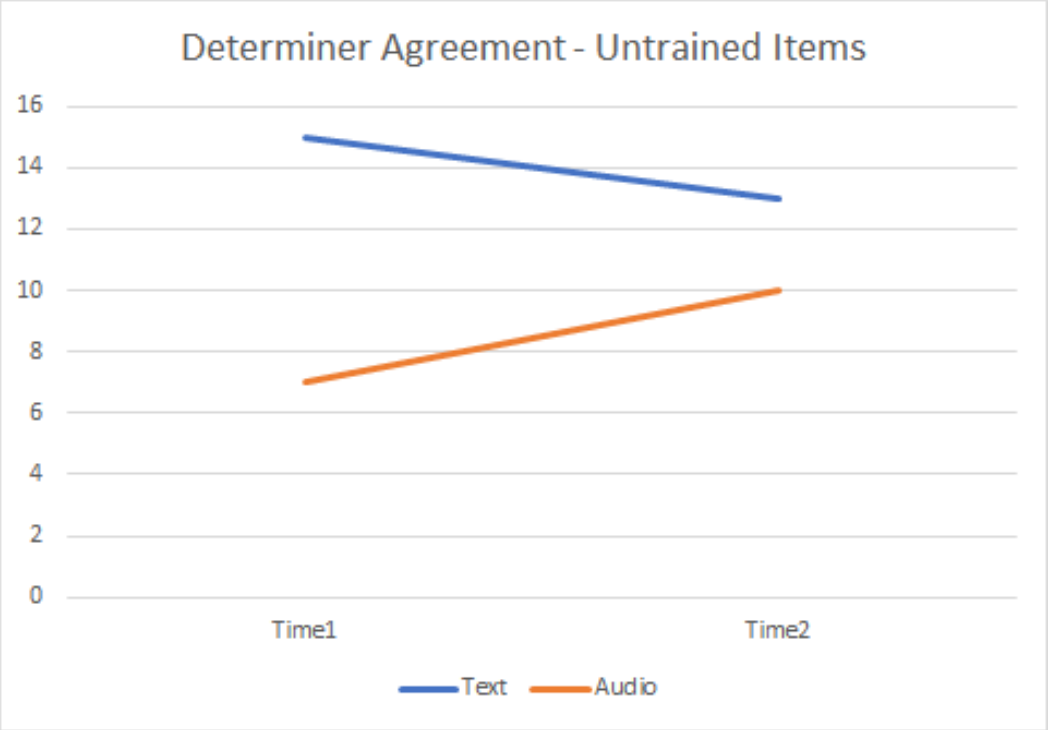

Figure 5-10: Performance of text and audio group on determiner agreement responses of untrained items– Experiment 1

A 2 (group: text vs. audio) x 2 (time: time 1 vs. time 2) x 2 (condition: trained vs. untrained) ANOVA revealed that the only significant effect within groups was that of condition with a large effect size (*F (1, 44) =6.286, p=0.02, partial* η^2 *=0.125*), while the difference between the two groups was not significant (*F (1, 44) =3.148, p=0.08, partial* η^2 *=0.07*). This means that the two groups did not succeed in generalising the trained condition with respect to determiner agreement.

5.3.2.3 Part 3: Adjective Agreement Responses

Table 5.8 shows the mean percentages and standard deviations of the participants' correct responses regarding adjective agreement, which consisted of the production of both the adjective and the noun.

Table 5.8: Mean percentages (and standard deviations) of the production of adjective agreement in the trained and untrained condition

	Trained condition		*Untrained condition*	
	Text group	*Audio group*	*Text group*	*Audio group*
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*
Time 1	*17 (15)*	*16 (14)*	*14 (12)*	*9 (10)*
Time 2	*22 (17)*	*13 (12)*	*17 (15)*	*21 (18)*

The mean percentages for trained items at time 1 were 17% for the text group and 16% for the audio group. As opposed to the audio group (*M*= 13%), the text group scored higher at time 2 (*M=22%*). With respect to untrained items, the text group scored higher than the audio group at time 1 (text group *M=14%;* audio group *M=9%).* However, that was not the case at time 2, where the audio group had the highest score (audio group *M=21%;* text group *M=17%*). Figures 5-11 and 5-12 below provide a visual representation of the two groups' performance on adjective agreement of trained and untrained items respectively.

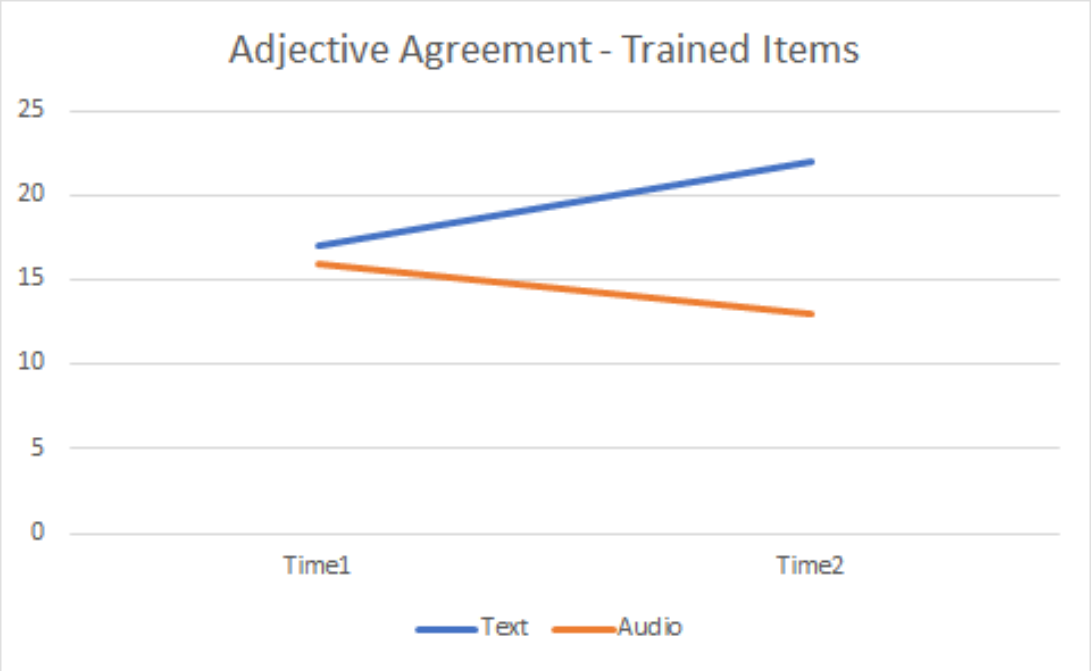

Figure 5-11: Performance of text and audio group on adjective agreement responses of trained items– Experiment 1

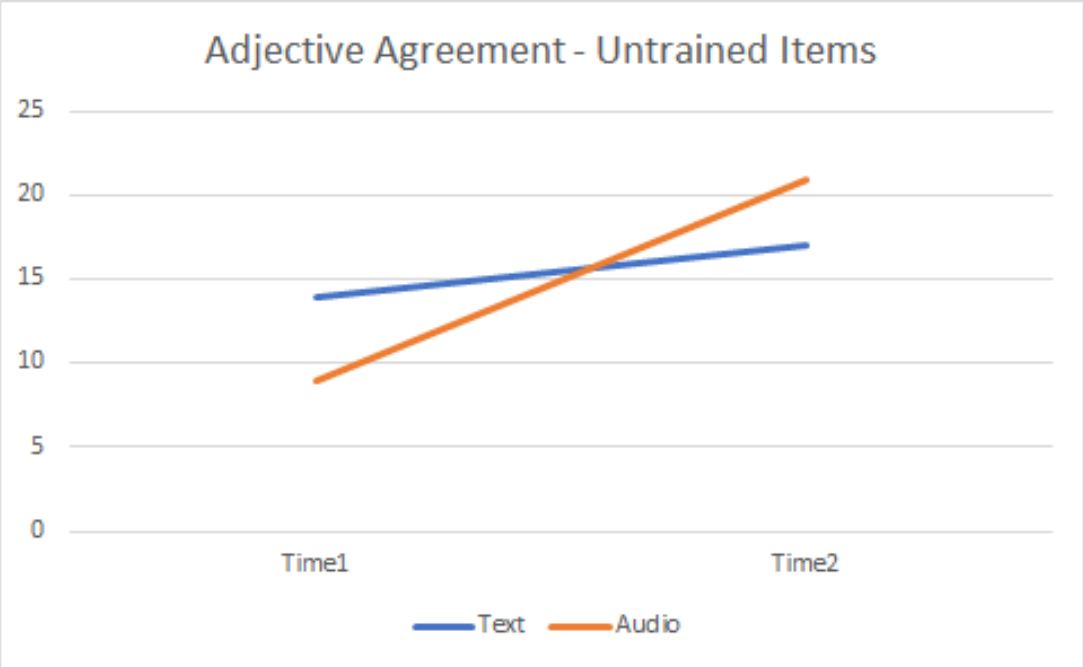

Figure 5-12: Performance of text and audio group on adjective agreement responses of untrained items– Experiment 1

A 2 (group: text vs. audio) x 2 (time: time 1 vs. time 2) x 2 (condition: trained vs. untrained) ANOVA revealed a significant effect of time with a large effect size (*F (1, 44) =5.377, p=0.03, partial* η^2 *= 0.109*). There was no interaction between condition and group (*F (1, 44) =2.996, p=0.09, partial* η^2 *= 0.064*), while there was a significant interaction between condition and time with a large effect size (*F (1, 44) =5.566, p=0.02, partial* η^2 *= 0.112*). The difference between the two groups was not significant (*F (1, 44) =0.828, p=0.4, partial* η^2 *= 0.02*). This means that differences in performance one week after training were significant within each group and this was due to condition. The text group did not generalise the trained condition at any time. The audio group did not generalise the trained condition at time 1 but did so at time 2, which was unexpected. This contradicted my prediction that performance would decline at time 2. Overall, it is possible that learners were more prepared about what to expect at time 2; however, I cannot explain why this happened with the audio group only.

5.3.3 Exit questionnaire

At the end of the delayed post-test, the participants were asked two questions: whether they noticed that the colour words had two different forms (Question 1) and how they decided which form to choose (Question 2). The aim of the exit questionnaire was to see whether the participants became aware of the existence of the two forms and whether they were able to verbalise their awareness. Thus, Question 1 concerned *noticing*, while answers to Question 2 were an indication of metalinguistic understanding. The participants' answers were interpreted with a specific focus on their

knowledge of morphologically rich languages (e.g. French, Spanish, German and Italian) and the potential influence of these languages to morphological awareness. That is because some of the learners referred to these languages either because they spoke some of them or because they had some knowledge of how these languages possibly work. The aim was to identify whether the knowledge of other such languages contributed to increased awareness of inflectional morphology. Table 5.9 shows the mean percentages of the participants' answers to each of the two questions.

Table 5-9 Percentages of affirmative responses in the exit questionnaire of Experiment 1

	Question 1 (Yes)	*Question 2 (Metaling. awareness)*
Text group	*100%*	*70%*
Audio group	*87%*	*61%*

In the text group, all of the participants stated that they noticed the two colour forms, while 70% provided metalinguistic explanations by referring to: specific endings (e.g. 'depending on the ending of the object. If in *-os,* the adjective was also in *-os*. If in *-i*, then it ended in *-i* too'); gender (e.g. 'I think it was based on gender, so *mávros* and *mávri*'); consonants and vowels (e.g. 'based on the first letter, whether *i* or *o*'); and sounds (e.g. 'some sounds were similar to the *o* or *i* sound, so I made that connection').

Seventeen out of 23 spoke one or more languages at a basic or intermediate level, whereas thirteen of the multilingual speakers were able to justify their

choices metalinguistically. Half of the monolingual learners did not show any signs of metalinguistic knowledge, stating that they answered based on what they remembered seeing on the screen. The other half showed some metalinguistic knowledge with statements such as 'if the object ended in *-os*, I picked the equivalent. If not, I would choose in *-i*', or 'it was the ending of the word, e.g. *mávros* with *kádhos*. If it ended in *-s,* then I would put *mávros*'. In other words, all of the participants belonging in the text group noticed the two colour forms, while the majority was able to provide metalinguistic explanations. Out of the 16 participants who showed metalinguistic awareness, 3 were monolingual speakers. Thus, based on the data from the text group, it is possible that text combined with the knowledge of languages other than English contributed to greater awareness of the morphological changes in inflections.

In the audio group, 87% noticed the two colour forms, as opposed to the text group where everyone stated to have noticed them. 61% of the answers to Question 2 included metalinguistic explanations, which was 9% less than the text group. The audio group used terms like 'gender-specific' or stated that they chose the colour form based on whether 'there was a vowel at the end of the object, e.g. *mávros kádhos* 'black bin' *mávri aposkeví* 'black suitcase' or 'if it ended in a consonant sound, then I would use the equivalent colour form'. Sixteen out of 23 spoke one or more languages mostly at a basic or low intermediate level, which was almost the same with the text group. Out of the 14 participants who showed metalinguistic awareness, 3 were monolinguals. This was the same with the text group.

The two groups' performance did not indicate that text contributed to a more increased awareness of morphology, since there was no significant difference between the two groups. Since both groups consisted of highly educated learners, this explains their high performance despite the lack of text in the audio group. Thus, both groups were able to notice agreement and provide correct responses. However, the qualitative data show that the presence of text contributed to the explanation of differences in the testing items explicitly, as well as to the fact that learners who were exposed to text were aware of the noticing that took place. Only in the audio group were there learners who stated not to have noticed the change in the colour forms, while the text group provided 9% more metalinguistic explanations than the audio group. Thus, despite the fact that there were no significant differences between the two groups in their oral production of singular agreement, the text group's responses to the questionnaire showed greater metalinguistic awareness with respect to inflectional morphology. The text group was also more able to provide explanations that were elaborate and contained the use of metalanguage.

5.4 Discussion

In this experiment, I examined how two different ways of exposure to determiner phrases in Greek, namely the text and the audio (non-text) modality, affected accuracy in the oral comprehension and production of adult L2 learners of Greek. Singular agreement was the target phenomenon. I focused in particular on the role of three variables: group (text versus audio), training condition (trained versus untrained), and time (immediate

versus delayed post-test). I hypothesised that type of group would affect the attention that the learners paid to form. That is to say, the text group would outperform the audio group by comprehending and producing responses that would be more accurate. I also hypothesised that the presence of text would contribute to a better generalisation of the trained condition. Finally, the two groups would perform better in the immediate than in the delayed post-test, as a result of not being able to retain the knowledge a week after training.

Both groups performed at ceiling in the comprehension tasks, which is an indication that training on singular agreement was equally effective for everyone. This also implies that performance in the oral production task was not linked to lack of comprehension, since both groups clearly understood the meaning of the L2 lexical items. It can be argued that this finding relates to the Missing Surface Inflection Hypothesis (MSIH) to some extent. According to the MSIH (Haznedar, 2001; Haznedar, 2003; Haznedar and Schwartz, 1997; Lardiere, 1998a, b, 2000; Prévost and White, 2000a, b), L2 learners are not aware of the knowledge they already possess on agreement and despite the fact that they might fail to consciously notice or apply functional categories, this does not deprive them from understanding the vocabulary.

The oral production task was scored for vocabulary and grammar. Both groups performed equally well on vocabulary, where they also scored considerably higher than in grammar. Lack of significant difference in the performance of the two groups showed that print did not have an effect on

vocabulary. The fact that the text group had scores significantly higher than the audio group at both times might be an indication that the text group managed to retain more vocabulary than the audio group. However, this difference was not large enough, indicating that learners can acquire vocabulary even when they are not exposed to print. Therefore, exposure to print seems to make more of a difference when learners need to pay attention to grammatical morphemes.

These findings support Ellis' (2008, 2017) theory, where learners become *selective* with respect to the attention they pay to language in order to reduce cognitive load. It is not possible to pay the same amount of attention to all aspects of language during learning. Processing of the input that the learner receives along with mapping of that input are cognitively demanding tasks, which require the learner to make a choice on what information to retain. Two factors determine the learner's selective attention, namely *frequency* and *salience*. The more frequent an item is, the more chances there are for that item to be learned. Given that grammatical, also known as *functional*, morphemes are among the most frequent items of language (Ellis and Sagarra 2010), one would assume that they are also acquired easily.

However, frequency of occurrence does not suffice for learning to take place. The target structure also needs to be a high salience cue, i.e. to be easily noticeable in speech and distinguishable from other cues. Despite their high frequency, functional morphemes are cues of low phonological salience, meaning they are not easily visualised in speech. In fact, it could be argued

that their high frequency determines their phonological salience (Ellis 2017; Schmidt 2001; Vainikka and Young-Scholten 1998). That is because, functional morphemes are repeated in speech to the point that they tend to get phonologically absorbed by lexical morphemes (e.g. nouns and adjectives). Lexical morphemes are phonologically more salient in speech, carry meaning and can usually stand on their own. Consequently, grammatical morphemes are less salient than lexical morphemes, and semantically redundant. This automatisation lowers the rate of learnability of grammatical morphemes considerably (Ellis, 2017). Therefore, learners acquire lexical morphemes before they notice functional morphemes. Both Pica's (1983) and Tarone et al.'s (2009) learners found difficulties in repeating nouns or noun phrases which contained plural inflectional morphology. Instead, they chose to replace grammatical morphemes like the plural *–s* ending with quantifying phrases (e.g. *a lot of*), which are more distinct in speech and convey plurality equally.

Previous studies have shown that form-focussed instruction increases salience by drawing the learner's attention to form through explicit teaching methodologies. For instance, Agathopoulou et al. (2008) tested adult L2 learners of Greek, who had received two types of instruction, in their acquisition of adjective-noun agreement (see Chapter 4, section 4.3.3). The researchers found that the learners performed better after receiving instruction in the target feature, while the group that was exposed to textually-enhanced adjectives and nouns performed better than the group that was not. Focus on form and exposure to print, especially when the latter

is textually enhanced through techniques such as font size, bold, and colour in order to draw explicit attention to morphology lead to better acquisition of the target feature. The researchers showed both the importance of text and of explicit instruction with respect to attention to form in adult L2 learning. Thus, it is possible that the implicit teaching of agreement in the current experiment combined with the low salience of the grammatical morphemes played a role in the low performance of the two groups.

Despite the fact that the learners experienced equal amounts of exposure to both vocabulary and grammar, they achieved much higher scores in vocabulary. The learners were able to retain the content words, adjectives and nouns in this case, and produce them orally. On the contrary, both groups had very low scores on grammar at both times, which means that they were unable to be accurate in their oral production of these low-salience cues. Even in cases when the learner was conscious of the existence of grammatical morphemes, it was still difficult to reproduce them.

With respect to the post-test, I predicted that performance would drop a week after training. However, time had an effect on vocabulary and adjective agreement responses only. My prediction was supported with respect to vocabulary but findings for grammar were mixed. There was a main effect of time only for adjective agreement, where the text group's performance improved in both conditions. However, the audio group's performance in the trained condition was lower at time 2 than at time 1, while it increased in the untrained from time 1 to time 2. The significant interaction between condition

and time showed that the audio group generalised the trained condition one week after training. Thus, contrary to my predictions, the audio group both improved and generalised at the delayed post-test. One explanation might be the similarity between mode of learning and mode of testing. The audio group had to rely solely on sound due to lack of exposure to text. Attention and motivation might have been high for the audio group from the very start for it to be able to remember the new input. Thus, the audio group had to put greater effort in retaining the target feature. Its increased performance in the delayed post-test might be the result of increased focus during practice.

The improved performance of the audio group at time 2 for adjective agreement was not expected, as opposed to the text group. Thus, another explanation might be that the learners were mentally prepared for the testing at the second visit. Having already experienced the same tasks at time 1 a week earlier, they were now aware that they would be asked to produce the target items orally. Despite the fact that at the beginning of the first session (time 1) I provided a general explanation of what would follow, as well as thorough instructions orally and in writing before each task, some of the participants were surprised when they heard that they had to describe pictures by producing Greek orally without the help of text or sound prior to production.

However, the learners were aware of the testing process at the delayed post-test. Therefore, it is possible that during the three comprehension tasks at time 2, which preceded the oral production task, the participants tried to pay

more attention to what they heard in order to perform better than in the oral production task of the first session. This originates from the possible connection between test expectancy and memory for important information. Put simply, the participants' expectations regarding type of testing have an impact on how important the participant sees the displayed information (Middlebrooks et al. 2017). This in turn also impacts what the participant retains in memory; the more the type of testing requires the participant to recall information, the more effort one puts into retaining that information. I did not investigate the factor of test expectancy and its impact on determining the importance of the relevant information in the methodology of the current experiment. This could possibly be addressed in the future by counter-balancing the testing order, i.e. to perform the oral production task before the comprehension tasks.

Finally, it is worth recalling the participants' answers during the exit questionnaire. The two groups had a similar number of monolingual and multilingual speakers, which probably means that presence of text made more of a difference than knowledge of other languages. Exposure to print made the text group more aware of the discrepancies in the forms, since all of its participants stated to have noticed the two adjective forms. On the other hand, three participants from the audio group said they did not notice the two forms. In addition, the content of the explanations that the text group provided were of a more form-focused nature than that of the audio group.

In short, although both groups were able to provide metalinguistic explanations, the text group showed greater awareness despite the low accuracy scores in the oral production of grammar. This indicates that text contributed to increasing the conscious awareness of the learners regarding grammatical morphemes and, consequently, to the ability to verbally report this noticing with metalanguage. However, the implicit teaching that took place was not enough for this internalising of morphology to turn into output and make the learners more able to produce the grammatical morphemes orally. Despite the fact that all participants of the text group responded affirmatively to Question 1, one fourth of those participants was unable to provide any metalinguistic explanations. In other words, *noticing* and *metalinguistic knowledge* are different levels of consciousness. Noticing does not entail the ability to verbalise that which is being noticed through metalinguistic terminology (Schmidt 1990, 2001). The findings of Kolinsky et al. (1987) and Kosmidis et al. (2006) support the argument that knowledge of alphabetic print contributes to increased awareness of the metalinguistic properties of the language.

With respect to the specific inflections, the participants were exposed to four noun endings, two for each gender: *-os* and *-as* for masculine, and *i-* and *-a* for feminine. However, in all cases where participants referred to noun endings by form, they only mentioned *-os* or *–i*, which confirms that these endings are the most representative for the two genders (Mastropavlou and Tsimpli 2011). More importantly, though, this possibly happened because these two noun endings (*–os* and *–i*) coincided phonologically both with the

definite articles (*o/i*) and the endings of the adjectives (*-os/-i*). With respect to input, there were several opportunities for the participants to attend to and repeat these forms. Even though they probably were not conscious of it, it is possible that the phonological match among all three constituents of the noun phrase (article-adjective-noun) caught the learners' attention on these two endings by increasing their level of salience and, thus, making them more salient than the *-as/-a* noun endings. Phonological matching between the adjectival and the nominal endings seemed to play an important role in Agathopoulou et al. (2008), where it was the main source of errors in all three production tasks.

A lengthier study is required in this case. Overall, 'adults have difficulty in the associative learning of form-meaning relations in linguistic constructions' (Ellis and Sagarra 2010: 554), where the level of the learner also plays an important role. DeKeyser (2005: 7), who reviewed some issues concerning L2 grammar difficulty, concluded that morphology is a weak cue to acquire especially for English speakers who are at an initial stage of the L2. Kimppa et al.'s (2019) findings supported this argument by showing that their more advanced learners had already developed some sensitivity to morphology as opposed to the beginners.

5.5 Conclusion

The current experiment looked at how text would influence the comprehension and oral production of singular agreement in L2 Greek. The aim was to test whether text would contribute to the accurate understanding

and noticing of grammatical morphemes by enhancing the learner's attention to form.

The results showed that comprehension was easier than oral production and that the learners scored higher in vocabulary than in grammar. This supports Ellis' (2017) selective attention theory, where he argues that it is easier for the learner to retain information that is not semantically redundant, optional, or opaque. In other words, the learners performed better in vocabulary than in grammar because vocabulary consists of words that carry the content of the sentence, such as nouns and adjectives. At the same time, this renders vocabulary necessary and transparent, as opposed to forms like the suffix *–s* in English which has three different functions. Thus, grammatical morphemes, which are part of the content words, go unnoticed due to their low salience, lack of meaning, and opacity.

Although the two groups' performance in agreement did not differ significantly, and both groups encountered difficulties with the oral production task, the answers to the exit questionnaire revealed signs of metalinguistic knowledge. The discrepancy between the low scores in production and the high levels of metalinguistic knowledge show that production is undoubtedly a more difficult task. In addition, although metalinguistic knowledge shows that noticing took place, being able to express that knowledge linguistically does not necessarily ensure the accurate production of grammatical morphemes.

Given that previous research has shown that explicit instruction increases attention to form (e.g. Agathopoulou et al. 2008), future research should study agreement in L2 Greek by comparing groups with and without text who receive different types of instruction. Finally, it would be worth including informal discussions in the form of exit questionnaires with more questions, in order to shed more light on learners' rationale behind their choices.

Chapter 6 – Verb Morphology in Modern Greek

Linguistic and Research Background

6.1 Introduction

This chapter provides an overview of the verb morphology in Greek with a focus on the Perfective Past Tense (PPT), which is one of the structures under investigation in Experiment 2. I firstly introduce the structure of verb phrases, verb morphology and subject-dropping. Next, I discuss verb categorisation and formation with regard to the PPT. Finally, I discuss the findings of previous studies on the PPT in Greek as a first and a second language.

6.2 Verb Phrases

The verbal system presents distinct morphological patterns, which in turn represent the elements of agreement, tense, voice, aspect and mood (Gallani 2005). The overt marking of these categories allows for the creation of numerous forms, while morphology simultaneously influences the structure of verb phrases in the sentence. For this reason, I will present the syntactic function of the verb phrase in the sentence before proceeding with the morphological analysis of the verb itself in more detail.

Verb phrases both in Greek and in English usually consist of the following: a verb (1), a direct object in the accusative case (2), an indirect object in the

genitive case (3), a subject predicate in the nominative case (4), an object predicate in the accusative case (5), and adverbial modifiers whose position depends on emphasis (6-7). In (6), the emphasis is on the fact that Maria had lunch but in (7) it is on the fact that Maria had lunch *yesterday* (Holton et al. 2004).

1. **Η Μαρία *τρώει*.**
   I María *tróï*.
   The-Maria-F.SG.NOM eat-PRS.3.SG.
   SUBJECT | VERB
   'Maria eats'.

2. **Η Μαρία τρώει *μεσημεριανό*.**
   I María tróï *mesimerianó*.
   The-Maria-F.SG.NOM eat-PRS.3.SG. lunch-N.ACC.SG.
   SUBJECT | VERB | OBJECT
   VERB PHRASE
   'Maria eats lunch'.

3. **Θέλω τα ρούχα *του Γιάννη*.**
   Θélo ta roúha *tou Jáni*.
   Ø want-PRS.1SG the clothes-N.ACC.PL the-Jani-M.GEN.SG.
   VERB | OBJECT (DIRECT) | OBJECT (INDIRECT)
   VERB PHRASE
   'I want Janis' clothes'.

4. **Η Μαρία είναι *γιατρός*.**
   I María íne *jatrós*.
   The-Maria-F.SG.NOM be-PRS.3.SG doctor-F.NOM.SG.
   SUBJECT | VERB | SUBJ. PREDICATE
   VERB PHRASE
   'Maria is a doctor'.

5. **Η Μαρία κάνει τον Κώστα *χαρούμενο*.**
   Ι María káni ton Kósta *haroúmeno.*
   The-Maria-F.SG make-PRS.3SG the-Kosta-M.ACC.SG. happy-M.ACC
   SUBJECT | VERB | OBJECT (DIRECT) | OBJ. PREDIC.
   VERB PHRASE
   'Maria makes Kosta happy'.

6. **Η Μαρία έφαγε μεσημεριανό *χθες*.**
   I María éfage mesimerianó *hθes.*
   The-Maria-F.SG.NOM eat-PST.3SG lunch-N.SG yesterday-ADV.
   SUBJECT | VERB | OBJECT | ADV. MODIFIER
   VERB PHRASE
   'Maria ate lunch yesterday'.

7. ***Χθες*, η Μαρία έφαγε μεσημεριανό.**
   Hθes, i María éfage mesimerianó.
   Yesterday-ADV the-Maria-F.SG eat-PST.3SG lunch-N.SG.
   ADV. MODIFIER[15] | SUBJECT | VERB | OBJECT
   VERB PHRASE

Verbs can be preceded by the particles *na* 'to' (subjunctive mood: 8), *θa* 'will' (future tense: 9), *as* 'let' (subjunctive mood: 10), *ðen* 'not' (negation: 11), the auxiliary verb *ého* 'I have' (perfect aspect: 12), or even a combination of the above (13-14).

8. **Η Μαρία θέλει *να φάει*.**
   I María θéli *na fái.*
   The-Maria-N.F.SG.NOM want-V.3SG.PRS to-eat-V.3SG.SBJ
   'Maria wants to eat'.

9. **Η Μαρία *θα* φάει.**
   I María *θa* fái.
   The-Maria-N.F.SG.NOM will-FTR eat-V.3SG.SBJ
   'Maria will eat'.

10. ***Ας* φάει η Μαρία.**
    As fái i María.
    Let-eat-SBJ.3.SG the-Maria-N.F.SG.NOM

[15] When the adverb moves to the beginning of the sentence and is no longer part of the verb phrase, its function changes to 'sentence adverbial' because it defines the whole sentence more closely.

‘Let Maria eat’.

11. Η Μαρία ***δεν*** **τρώει.**
I María *ðen* tróï.
The-Maria-N.F.SG.NOM *not* eat-V.PRS.3SG.
‘Maria does not eat’.

12. Η Μαρία ***έχει*** **φάει.**
I María *éhi* fáï.
The-Maria-F.SG.NOM have-V.3SG.PRF eat-V.3SG.SBJ
‘Maria has eaten’.

13. Η Μαρία ***δεν έχει*** **φάει.**
I María *ðen* éhi fáï.
The-Maria-F.SG.NOM not have-PRS.3SG eat-PRF.3SG.
‘Maria has not eaten’.

14. Η Μαρία *δεν θα* φάει.
I María *ðen θa* fáï.
The-Maria-F.SG.NOM not will-FTR eat-V.3SG.SBJ
‘Maria will not eat’.

6.3 Verb Morphology and Subject-dropping

Inflectional suffixes express the grammatical categories of agreement[16] (person and number: 15-24):

First singular and plural (*egó* ‘I’: 15; *emís* ‘we’: 16)

15. ***Εγώ*** **τρέχ-*ω***
Egó tréh-***o***
I-1SG run-PRS.1SG
‘I run.’

16. ***Εμείς*** **τρέχ-*ουμε***
Emís tréh-***ume***
We-1PL run-PRS.1PL
‘We run.’

Second person singular and plural (*esí* ‘you’ SING: 17; *esís* ‘you’ PLU: 18)

17. ***Εσύ*** **τρέχ-*εις***
Esí tréh-***is***
You-2SG run-PRS.2SG

‘You run.’

18. ***Εσείς*** **τρέχ-*ετε***

[16] Modified, Holton et al. (2004: 116-117).

Esís tréh-***ete***
You-2PL run-PRS.2PL
'You run.'

Third singular and plural (*aftós* 'he': 19; *aftí* 'she': 20; *aftó* 'it': 21; *aftí* 'they' MASC: 22*; aft*és 'they' FEM: 23*; aftá* 'they' NEU: 24*)*.

19. ***Αυτός*** **τρέχ-*ει***
Aftós tréh-***i***
He-3SG run-PRS.3SG
'He runs.'
20. ***Αυτή*** **τρέχ-*ει***
Aftí tréh-***i***
She-3SG run-PRS.3SG
'She runs.'
21. ***Αυτό*** **τρέχ-*ει***
Aftó tréh-***i***
It-3SG run-PRS.3SG
'It runs.'
22. ***Αυτοί*** **τρέχ-*ουν***
Aftí tréh-***un***
They-MASC.3PL run-PRS.3PL
'They run.'
23. ***Αυτές*** **τρέχ-*ουν***
Aftés tréh-***un***
They-FEM.3PL run-PRS.3PL
'They run.'
24. ***Αυτά*** **τρέχ-*ουν***
Aftá tréh-***un***
They-NEU.3PL run-PRS.3PL
'They run.'

Tense (25-27): non-past (Simple Present: 25; Perfective Future: 27), past (Simple Past: 26).

25. **Εγώ διαβάζ-*ω***
Egó ðiaváz-***o***
I-1SG study-PRS.1SG
'I study.'
26. **Εγώ διάβα-*σ-α***
Egó ðiáva-***s-a***
I-1SG study-PST.1SG
'I studied.'
27. **Εγώ *θα* διαβά-*σ-ω***
Egó ***θa*** ðiavá-***s-o***
I-1SG will-FTR study-1SG.SBJ
'I will study.'

Voice (28-29): active (28), passive (29)

28. Εγώ ακού-ω
*Egó akoú-**o***
I-1SG hear-PRS.1SG.ACT
'I hear.'

29. Εγώ ακού-γ-ομαι
*Egó akoú-g-om**e***
I-1SG hear-PRS.1SG.PASS
'I am heard.'

Aspect (30-32): perfective (completed action: 30), imperfective (incomplete action: 31), perfect (action completed in the past but still relevant to some point in time: 32).

30. Η Μαρία έφαγ-*ε* πρωινό.
I María éfag-***e*** proïnó.
The-Maria-N.3SG eat-V.3SG.ACT.PST.PRF breakfast.
'Maria ate breakfast'.

31. Η Μαρία τρώ-*ει* πρωινό.
I María tró-***i*** proïnó.
The-Maria-V.3SG eat-V.3SG.ACT.PRS.IMPF breakfast.
'Maria eats breakfast.'

32. Η Μαρία *έχ-ει φά-ει* τρεις φορές από το πρωί.
I María ***éh-i*** ***fá-ï***
The-Maria-V.3SG have-AUX.3SG.ACT.PRS eat-V.3SG.ACT.PRF
tris forés apó to proï.
three times since this morning.
'Maria has eaten three times since this morning.'

And mood (33-34): non-imperative (33), imperative (34)

33. Εγώ μιλά-*ω* δυνατά.
Egó milá-***o*** ðinatá
I-1SG speak-V.1SG.ACT.IND.PRS.IMPF loudly
'I speak loudly.'

34. Μίλ-*α* δυνατά!
Míl-***a*** ðinatá!
Speak-V.1SG.ACT.IMPF loudly!
'Speak loudly!'

Tenses are categorised as past and non-past. The 'past' tenses are the equivalent of Past Continuous (e.g. *élina* 'I was solving'), Simple Past (e.g. *élisa* 'I solved), and Past Perfect in English (e.g. *íha lísi* 'I had solved'), while

the ‘non-past’ tenses are the Present (e.g. *líno* ‘I solve’), the Present Perfect (e.g. *ého lísi* ‘I have solved’), the Future (e.g. *Θa líso* ‘I will solve’) and the Future Progressive (e.g. *Θa líno* ‘I will be solving’).

Similar to English, voice indicates whether the subject of the sentence is the initiator of the action (e.g. *o patéras **pléni** ta roúha* ‘the father **washes**-ACT.PR.3SG the clothes’) or the entity that is affected by the action (e.g. *ta roúha **plénonde** apó ton patéra* ‘the clothes **are-washed**-PAS.3PL by the father’). Contrary to English, the passive voice in Greek forms its own morphology with endings for tense, person and number distinct from the active voice (e.g. *plén**o*** ‘I wash’ in the active voice becomes *plén**omai*** ‘I am washed’ in the passive voice). The usual endings are *–ω (o)* for the active voice and *–αι (e)* for the passive voice, while the equivalent of ‘by’ in the passive voice is the preposition *από (apó)*.

However, there are verbs that form only one or the other voice, while the aforementioned endings are not always indicative of voice. For instance, there are verbs in the active voice ending in *–o* that do not indicate any action (e.g *ðips**ó*** ‘I am thirsty’ as opposed to *tréh**o*** ‘I run’) and verbs ending in *–e* that are not in the passive voice, as the entity is not directly affected by the event (e.g *peripjúm**e** [kápjon]* ‘I look after [someone]’ as opposed to *eksetázom**e*** ‘I am examined’) (Holton et al. 2004). Thus, the learner cannot always rely on the two endings in order to distinguish voices.

Aspect deals with the completion or not of an action and with the time of completion. There are three aspects in Greek: the imperfective, where the action occurs in repetition or is still in progress (e.g. *to korítsi* ***éline*** *ta korđónia* 'the girl **was untying** her shoelaces'); the perfective, where the action is completed (e.g. *to korítsi* ***élise*** *ta korđónia* 'the girl **untied** her shoelaces'); and the perfect aspect, where the action is completed in the past but is still relevant in time (e.g. *to korítsi* ***éhi lísi*** *ta korđónia* 'the girl **has untied** her shoelaces') (Holton et al. 2004). Combined together, the two categories of tense and aspect create the tenses of the verb; thus, the name of a tense is based on both aspect and tense. The only two verb forms that remain invariant (non-finite) are the gerund and the form that follows the auxiliary 'have' (*ého*) to form the Perfect tenses.

Finally, mood is distinguished as 'imperative' and 'non-imperative', and uses the verb to communicate the speaker's mood. 'Imperative' forms consist solely of the imperative mood, where the verb expresses order and request. 'Non-imperative' forms consist of the indicative and the subjunctive moods. The indicative mood is used to make a statement, whereas the subjunctive mood is used to express wish or desire and is widely used in Greek. The subjunctive differs from the indicative in some augment changes in regular verbs, in the use of the particles *na* 'that/to' and *as* 'let', and in the use of the negative particle *min* 'not' instead of *đen* 'not' in the indicative.

Greek has two verb conjugations, namely conjugation I and II. The verbs that are stressed on the last syllable of the stem, when they are in the first

singular person active present tense, belong to conjugation I (e.g. ***tré**h-o* 'I run'; *a**ní**g-o* 'I open'). The verbs that are stressed on the last vowel of the first singular person ending in the active present tense belong to conjugation II (e.g. *anisih-**ó*** 'I worry'; *agap-**ó*** 'I love'). The majority of verbs belong to conjugation I. Conjugation II is further divided into types A and B based on the vowel used to conjugate the verb in the active present tense (Holton et al. 2004). In other words, verbs of conjugation II have two different vowels dominating their present tense endings. Type A endings use the vowel *α*, and have as follows: *-ώ(ό), -άς(ás), -ά(ει) (á(i)), -άμε (áme), -άτε (áte), -ούν (ún)*, while type B endings are dominated by vowels *ει (i)* and *ου (u)*, and have as follows: *-ώ (ó), -είς (ís), -εί (í), -ούμε (úme), -είτε (íte), -ούν (ún)*. Type B of conjugation II, and conjugation I endings are the same apart from the second person plural number, which changes from *–είτε (íte)* to *–ετε (ete)* respectively[17]. Tables 6.1 and 6.2 show the endings of conjugations I and II respectively.

Table 6-1 Verb endings of conjugation I in Greek – Active Present tense

	Conjugation I	
Sg. 1	*tréh-**o***	'I run'
2	*tréh-**is***	'You run'
3	*tréh-**i***	'He/she/it runs'
Pl. 1	*tréh-**ume***	'We run'
2	*tréh-**ete***	'You run'
3	*tréh-**un***	'They run'

[17] See Holton et al. (2004: 126-141) for a thorough description of the endings of all tenses in both voices, for alternative (less formal) verb endings, as well as some special verb categories, such as defective, impersonal, and deponent verbs, verbs with contracted present forms, and verbs with irregular form of active dependent.

Table 6-2 Verb endings of conjugation II in Greek - Active Present tense

Conjugation II			
Type A		**Type B**	
*agap-**ó***	'I love'	*anisih-**ó***	'I worry'
*agap-**ás***	'You love'	*anisih-**ís***	'You worry'
*agap-**á(i)***	'He/she/it loves'	*anisih-**í***	'He/she/it worries'
*agap-**áme***	'We love'	*anisih-**úme***	'We worry'
*agap-**áte***	'You love'	*anisih-**íte***	'You worry'
*agap-**ún***	'They love'	*anisih-**ún***	'They worry'

Thus, there are many issues to consider while applying verbal morphology in Greek. In the next section, I will discuss the differences that occur in the formation of the Perfective and the Imperfective Past tenses, as well as how these two tenses determine verb regularity.

6.4 The Perfective and Imperfective Past Tenses in Greek

Tense and aspect are closely linked in Greek. With respect to the past, a tense can be marked either as 'perfective' (Perfective Past Tense) or 'imperfective' (Imperfective Past Tense). In the PPT, the event is seen as complete at the time of speaking (e.g. *élisa to próvlima* 'I solved the problem'), while in the Impf the event is seen as incomplete or ongoing (e.g. *élina to próvlima* 'I was solving the problem'). The two tenses have some common characteristics with respect to regular verbs. First, stress moves

syllables during the formation of the two past tenses. The two tenses are characterised by antepenultimate (APU) stress, meaning that PPT and Impf verb forms are stressed on the third syllable from the end (e.g. *si-**kó**-no* ‘I lift’ becomes ***sí**-ko-sa* ‘I lifted’ and *s**í**-ko-na* ‘I was lifting’ respectively). It is worth noting that the Impf stem is the same as the Present tense stem (*sikon-*). To form the PPT, the last consonant of the Impf stem changes based on predictable for each conjugation phonological changes. In the case of *sikóno*, the stem ends in *–n–* after a vowel, which turns to the sigmatic suffix *–s–* (*síko**s**-*) (Holton et al. 2004: 144).

However, there are verbs with less than three syllables, which means that the APU stress rule cannot be implemented on the original form of the verb. In this case, the syllabic augment ***é***- is applied, which creates the necessary third syllable for the APU stress. The syllabic augment does not apply to verb stems with more than one syllable. It specifically concerns verbs that have a one-syllable stem that begins with a consonant and a one-syllable ending, and is applied in some persons of the first-conjugation verbs (Holton et al. 2004). For instance, the verb *háno* ‘I lose’ belongs to conjugation I because it is stressed on the last syllable of the stem. Both its stem (*hán-*) and ending (*-o*) have only one syllable, while the stem begins with a consonant. Therefore, *háno* fills all the criteria for the syllabic augment. It becomes ***é-**han-a* ‘I was losing’ in the Impf and ***é-**has-a* ‘I lost’ in the PPT. Note that the majority of verbs belong to conjugation I.

However, the syllabic augment rule does not apply to conjugation II verbs even if the verb fills the above criteria. For instance, *gennó* 'I give birth to' gives the impression of a conjugation I verb due to its one-syllable stem beginning with a consonant (*génn-*) and the one-syllable ending (*-ó*). However, it belongs to conjugation II because it is stressed on the last vowel of the ending in the active Present tense (*-ó*). To form the two past tenses, a syllable is added after the stem: *–oús–* for the Impf and *–is–* for the PPT. Thus, there is no need for the syllabic augment. *Gennó* becomes *gennoúsa* 'I was giving birth to' in the Impf and *génn-is-a* 'I gave birth to' in the PPT. Note that conjugation II verbs take penultimate (second syllable from the end) instead of antepenultimate stress in the Impf (*genn**oú**sa*).

Two other types of augments can be applied to specific verbs while forming the two past tenses: the vocalic and the internal augment. As already mentioned, the syllabic augment (which is a vowel) applies to verbs that begin with a consonant. On the contrary, the vocalic augment is applied to verbs that begin with the sounds *e-* (as in 'echo') and *a-* (as in 'alpha') by turning them into the vowel *η- 'i'* (as in 'hint'). According to Holton et al. (2004: 152), there are only two such words currently in use which take stressed initial vocalic augment in their active past tenses (*elpízo* 'I hope' and *elénho* 'I control'), while there are three widely-used verbs that take the vocalic augment without, however, starting with a vowel (*θélo* 'I want'; *kséro* 'I know'; and *píno* 'I drink'). The Impf of *píno* is an exception in that it is formed with the syllabic augment *é-. Θélo*, *kséro* and *píno* are irregular because they do not follow all of the rules and do not form all of the tenses.

Tables 6.3 and 6.4 show how the Impf and the PPT of these verbs are formed respectively.

Table 6-3 The most common verbs with vocalic augment in the active Imperfective Past tense

	Verbs with Vocalic Augment			
	Imperfective Past Tense Formation			
	Augment	**Stem**	**Ending**	**Final Form**
***elpízo* 'I hope'**	*í-*	*-lpiz-*	*-a*	*ílpiza* 'I was hoping'
***Elénho* 'I control'**[18]	*í-*	*-lenh-*	*-a*	*ílenha* 'I was controlling'
***θélo* 'I want'**	-	-	-	-
***kséro* 'I know'**	-	-	-	-
***píno* 'I drink'**	*é-*	*-pin-*	*-a*	*épina* 'I was drinking'

Table 6-4 The most common verbs with vocalic augment in the active Perfective Past tense

	Verbs with Vocalic Augment			
	Perfective Past Tense Formation			
	Augment	**Stem**	**Ending**	**Final Form**
***elpízo* 'I hope'**	*í-*	*-lpis-*	*-a*	*ílpisa* 'I hoped'
***elénho* 'I control'**	*í-*	*-lenks-*	*-a*	*ílenksa* 'I controlled'
***θélo* 'I want'**	*í-*	*-θel-*	*-a*	*íθela* 'I wanted'
***kséro* 'I know'**	*í-*	*-kser-*	*-a*	*íksera* 'I knew'
***píno* 'I drink'**	*í-*	*-pj-*	*-a*	*ípja* 'I drank'

The internal augment concerns verbs preceded by a prepositional prefix originating from Ancient Greek. For instance, the verb *ipoválo* 'I submit' consists of the preposition *ipo-* 'under' and the verb *válo* 'put'. The past tense

[18] Vocalic augment tends to disappear in *elénho*. Nowadays, people tend to say *élenha* 'I was controlling' and *élenksa* 'I controlled'.

of *válo* is *évala*. If we add the prepositional prefix, the new form becomes *ipoévala*. However, phonological rules dictate that the last vowel of the preposition is dropped when followed by the syllabic augment *é*- (with the exception of *peri*- 'about' and *pro*- 'afore') (Holton et al. 2004). In short, the two vowels cannot co-exist. Thus, the final form of the verb becomes *ipévala* 'I submitted'. Finally, there are a few cases where internal and vocalic augment co-occur. The verb *ipárho* 'I exist' consists of the prepositional prefix *ipo*- and the ancient verb *árho* 'to begin'. Since *árho* starts with a vowel, it takes the vocalic augment *–í–* in order to form the Impf (*írha*). However, the latter does not exist in Modern Greek without the prepositional prefix. By adding *ipo*-, the verb becomes *ipoírha*. Finally, the preposition drops its final vowel (*-o*-) and the verb becomes *ipírha* 'I used to exist' in the Impf. Despite the fact that *ipárho* is among 'irregular' verbs in Holton et al. (2004: 167), it still follows the phonological stem change rule of conjugation I verbs, where imperfective verb stems ending in a velar consonant (*-h*-) form the active perfective with *–ks–* (ibid: 143). Thus, *ipírha* 'I used to exist' becomes *ipírksa* 'I existed'.

Thus far, I discussed the most common characteristics of both conjugations with regard to the formation of the two past tenses, i.e. the APU stress and the three types of augment. Hereinafter, I will discuss the changes that take place within the verb stem of each conjugation and which distinguish the two past tenses morphologically.

The main distinction between the two past tenses is in the formation of the stem. The imperfective stem is the same as the Present tense stem. Thus, in order to form the Impf, we borrow the Present tense stem and add the past tense endings. This formation rule applies to both conjugations. From this point onward, I will discuss by distinguishing the rules for each conjugation. Let us look at how the verb *líno* 'I solve' of conjugation I forms the two past tenses (see Table 6.5).

Table 6-5 How a first-conjugation sigmatic verb with a monosyllable stem is conjugated in the Active Imperfective and Perfective Past Tenses – the verb líno 'I solve'

		Imperfective and Perfective Past Tenses - *Líno* 'I solve'			
		Imperfective Past Tense		**Perfective Past Tense**	
Sg.	**1**	*élina*	'I was solving'	*élisa*	'I solved'
	2	*élines*	'You were solving'	*élises*	'You solved'
	3	*éline*	'He/she/it was solving'	*élise*	'He/she/it solved'
Pl.	**1**	*línаme*	'We were solving'	*lísame*	'We solved'
	2	*línate*	'You were solving'	*lísate*	'You solved'
	3	*élinan*	'They were solving'	*élisan*	'They solved'

Its Present tense stem is *lín-*. The first singular past tense ending is *–a*, so the verb becomes *lína*. Next, we apply the APU stress rule based on all of the aforementioned patterns with respect to number of syllables in the stem and the ending of the first person singular in the active Present tense. *Líno* has a one-syllable stem beginning with a consonant (*lín-*) and a one-syllable

Present tense ending (*-o*). Therefore, the rule of the syllabic augment *é-* applies and *lína* becomes ***é****lina* ‘I was solving’.

The formation of the PPT ‘depends on the ending of the imperfective stem’ (Holton et al. 2004: 141). In other words, the last letter or cluster of the imperfective stem determines the change that the stem will undergo in order to form the PPT (see Appendix G, Table G1 for a description of these phonological changes of first-conjugation verbs). The imperfective stem of *líno* ends in *-n-* (after a vowel), in which case *-n-* turns into the active perfective *-s-*. Therefore, *élina* ‘I was solving’ becomes *éli****s****a* ‘I solved’ (see Table 6.5). On the other hand, Table 6.6 is an example of how a first-conjugation verb that does not require any augments is conjugated in the two past tenses. The imperfective stem of *ðiavázo* ‘I read’ ends in *-z-*, so the active perfective is formed with the suffix *–s–* (see Appendix G, Table G1). ***Ð****iavázo* is a three-syllable verb with a two-syllable stem. Thus, the APU stress rule applies without any augments and *ðiavázo* becomes *ðiáva****s****a* ‘I read’ in the PPT.

Table 6-6 How a first-conjugation sigmatic verb with a two-syllable stem is conjugated in the active imperfective and perfective past tenses – the verb ðiavázo 'I read'

		Imperfective and Perfective Past Tenses - *Ðiavázo* 'I read'			
		Imperfective Past Tense		**Perfective Past Tense**	
Sg.	**1**	*ðiávaza*	‘I was reading’	*ðiávasa*	‘I read’
	2	*ðiávazes*	‘You were reading’	*ðiávases*	‘You read’
	3	*ðiávaze*	‘He/she/it was reading’	*ðiávase*	‘He/she/it read’

Pl.	**1**	*ðiavázame*	‘We were reading’	*ðiavásame*	‘We read’
	2	*ðiavázate*	‘You were reading’	*ðiavásate*	‘You read’
	3	*ðiávazan*	‘They were reading’	*ðiávasan*	‘They read’

Note that the stress returns to its original syllable in the first and the second plural persons of both verbs (Impf: *lí**n**ame, lí**n**ate* and *ðiav**á**zame, ðiav**á**zate*; PPT: *lí**s**ame, lí**s**ate* and *ðiav**á**same, ðiav**á**sate*). However, that syllable is now in the APU position, so the verbs are still following the APU stress rule. That is because the past tense endings of the first and the second plural persons have two syllables (*-a-me* and *-a-te* respectively). Thus, since there is now an additional syllable, the stress needs to drop in order to comply with the APU stress rule.

Based on the aforementioned, one notices a similarity in the formation of the active perfective stems: the appearance of the suffix –*s*–, which replaces the last letter or cluster of the imperfective stem. Verbs that form the active perfective with the suffix ‘-s-’ belong to the ‘sigmatic’ condition, named after the letter ‘sigma’ (*s*) of the Greek alphabet. Despite the variation in imperfective stem endings (see Appendix G, Table G1), sigmatic verbs are considered ‘regular’ due to the *-s-* pattern and the predictable phonological stem changes (Stavrakaki and Clahsen 2009). Consequently, non-sigmatic verbs are considered ‘irregular’ due to the arbitrarinesses presented in the formation of their active perfective stems and the lack of the sigmatic suffix. For instance, despite the fact that verbs whose imperfective stem ends in –*z*– take the sigmatic suffix –*s*–, the verb *vázo* ‘I put’ becomes *é**v**ala* ‘I put’ in

the PPT instead of *évasa* (see Holton et al. 2004: 155-168 for a table of the most common irregular verbs and on how to form the first person singular of the Present tense, of the active PPT, of the passive PPT, and of the passive Perfect Participle).

With respect to conjugation II, the general rule is that the syllable *–oús–* is added to the stem to form the Impf (see Table 6.7) and the syllable *–is–* for the PPT (see Table 6.8) regardless of type A or type B verbs. The verb *gennó* 'I give birth to' belongs to conjugation II because it is stressed on the last vowel of the ending. To form the Impf, the syllable *–oús–* and the past tense ending are added next to the stem (*genn-oús-a* 'I was giving birth to'). To form the PPT, the syllable *–is–* and the past tense ending are added next to the stem (*génn-is-a* 'I gave birth to'). Therefore, there are differences in the formation of the past tenses between the two conjugations.

Table 6-7 How a second-conjugation verb is conjugated in the Active Imperfective Past tense - The verb gennó 'I give birth to'

		Conjugation II	
		Imperfective Past Tense - *Gennó* 'I give birth to'	
Sg.	**1**	*Gennoúsa*	'I was giving birth to'
	2	*Gennoúses*	'You were giving birth to'
	3	*Gennoúse*	'He/she/it was giving birth to'
Pl.	**1**	*Gennoúsame*	'We were giving birth to'
	2	*Gennoúsate*	'You were giving birth to'
	3	*Gennoúsan*	'They were giving birth to'

Table 6-8 How a second-conjugation verb is conjugated in the Active Perfective Past tense - The verb gennó 'I give birth to'

		Conjugation II	
		Perfective Past Tense - *Gennó* 'I give birth to'	
Sg.	**1**	*Génnisa*	'I gave birth to'
	2	*Génnises*	'You gave birth to'
	3	*Génnise*	'He/she/it gave birth to'
Pl.	**1**	*Gennísame*	'We gave birth to'
	2	*Gennísate*	'You gave birth to'
	3	*Génnisan*	'They gave birth to'

However, not all conjugation II verbs follow the aforementioned pattern. For instance, the verb *geló* 'I laugh' becomes *gélasa* 'I laughed' instead of *gélisa*, while *apoteló* 'I constitute' becomes *apotélesa* 'I constituted' instead of *apotélisa*. Thus, even if verbs belong to the same conjugation and present the same morphology, they can be conjugated differently.

To summarise, inflectional morphology plays a vital role in Greek. Verbs are marked for agreement, tense, voice, aspect and mood, which renders the dropping of the subject canonical in the majority of cases. In addition, the formation of verb tenses is achieved by combining the grammatical categories of tense and aspect. Thus, the Impf is characterised by an incomplete action in the past, while the PPT by an event that is already complete at the time of speaking. With respect to the two tenses, verbs are categorised as 'sigmatic' when their stem contains the sigmatic suffix *–s–*

and as ‘non-sigmatic when the –*s*– suffix is absent. Thus, the two tenses also determine how regular the formation of a verb can be. In the next section, I will introduce the findings of previous research on past tense formation in Greek.

6.5 Modern Greek as a First Language

Children’s studies on the acquisition of inflectional morphology have shown that children have mostly acquired the inflectional morphology of Greek by the age of 7, at least as far as person and number for verbs are concerned (e.g. see Theophanopoulou-Kontou 2002, Mastropavlou, 2006). It is worth pointing out that children of that age still encounter difficulties with forming verb aspect (see below for a detailed account of Stavrakaki and Clahsen (2009) on the acquisition of the perfective past tense by children in different age groups). Diamanti et al. (2018) also looked at metalinguistic skills in pre-kindergarten to first graders and found that the metalinguistic skills both of derivational and inflectional morphology these children possessed were a result of spoken language experience since they had not yet been exposed to any literacy training. The inflectional morphemes that these children were able to manipulate belonged to verbs in the active voice present tense (see also Rothou and Padeliadu, 2015, in section 4.3). For earlier age groups, Christofidou and Stephany (2003) studied the inflectional development of two Greek children aged between 1;8 and 2;1 years. The analysis showed that aspect, mood, tense, person and number developed first in a lexicon-based way.

Overall, it seems that Greek children acquire inflections between the ages of 4 to 7 for the most part. However, aspect, and specifically the perfective past tense, remains a characteristic of inflectional morphology that requires the children to be in a more advanced metalinguistic skills period, since children up to the age of 8.5 years still make mistakes. For this reason and the fact that the design of Experiment 2 in Chapter 7 is based on the design of Clahsen and colleagues' studies (Clahsen et al., 2010; Stavrakaki and Clahsen, 2009), in the next sections, I provide a detailed account of the two studies. Stavrakaki and Clahsen (2009) focused on the acquisition of the perfective past tense by children native speakers of Greek, while in their follow-up study, Clahsen et al. (2010) focused on the same construction for adult L2 learners of Greek this time.

Stavrakaki and Clahsen (2009) looked at the acquisition of the PPT by 154 children belonging in six different age groups (from 3.5 to 8.5 years of age). The control group consisted of 35 adult native speakers. The researchers' aim was to look at the generalisation processes Greek children adopt when they use the PPT, as well as how these processes evolve over time. To achieve that, participants were tested on existing and novel verb forms. They were specifically tested on 10 existing sigmatic verbs (e.g. *líno* 'I untie' – *élisa* 'I untied'), 10 existing non-sigmatic verbs (e.g. *tróo* 'I eat' – *éfaga* 'I ate'), 10 novel verbs that rhymed with sigmatic existing verbs (e.g. *víno*), 10 novel verbs that rhymed with existing non-sigmatic verbs (e.g. *próo*), 10 non-rhyming novel verbs (e.g. *kiróvo*) and 20 filler items (see Appendix H).

Participants were tested individually through a production and an acceptability judgement task. In the oral production task, the participants were presented with pairs of pictures. Overall, there were 50 pairs for the testing items and 10 for the fillers. The first picture was described by the researcher and depicted an on-going action (e.g. *edó to agóri halái to pehnídi* 'here the boy is breaking the toy'; see Figure 6.1).

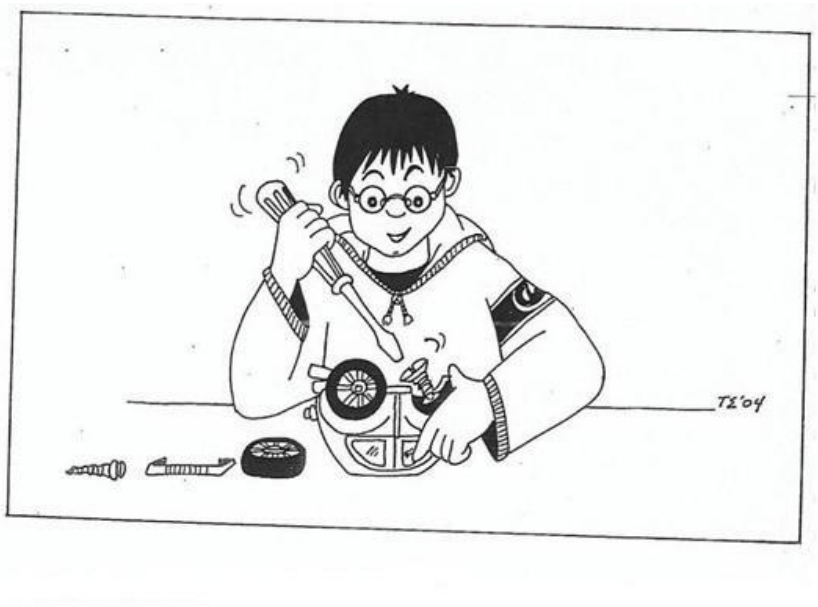

Figure 6-1 Sample of the first picture in the oral production task (Stavrakaki and Clahsen 2009)

The second picture depicted the same action as the first with the difference that the action was completed (e.g. *to agóri hálase to pehnídi* 'the boy broke the toy'). The researcher asked a question about what had happened in the picture (e.g. *ke edó, to agóri ékane ti?* 'and here, the boy did what?'). The participant's task was to describe the second picture with the completed event by producing the target verb in the PPT (see Figure 6.2).

Figure 6-2. Sample of the second picture in the oral production task (Stavrakaki and Clahsen 2009)

In the acceptability judgement task, the researcher repeated the Simple Present sentence as in the oral production task. Next, two puppets produced two possible answers, which differed only in the past tense form of the verb. With respect to existing verbs, the two puppets produced the PPT form (e.g. *to agóri* ***hálase*** *to pehnídi* 'the boy **broke** the toy) and the Impf form of the verb (e.g. *to agóri* ***haloúse*** *to pehnídi* 'the boy **was spoiling** the toy'). With respect to novel verbs, the two possible answers were either the sigmatic or the non-sigmatic form. The participant's task was to choose one of the two answers or to provide a third alternative if they did not agree with any of the two choices.

Results for the existing verbs in the production task showed that acquisition of the sigmatic form precedes that of the non-sigmatic form. Children performed better in the sigmatic than in the non-sigmatic verbs, while the

younger the children the more evident the difference was in performance between the two conditions (e.g. there was a difference of 9.17% in 8-9-year-olds and a difference of 34.46% in 3-4-year-olds). The two-way ANOVA revealed significant main effects of group (*F (6, 83) =19.73, p<0.00*) and condition (*F (1, 83) =153.04, p<0.00*), as well as a significant interaction between group and condition (*F (6, 83) =5.91, p<0.00*). With respect to performance in the sigmatic condition and in comparison with the control group, which performed at ceiling in both conditions, the two oldest child groups were the only ones who approached the adult group's performance (99.17% for 8-9-year-olds and 100% for 7-8-year-olds). This was not the case for the non-sigmatic condition, where all child groups performed significantly lower than the adult group with large effect sizes (see Table 6.9).

Table 6-9 Comparison between the child groups and the adult group on the accuracy of the sigmatic forms in the oral production task

GROUPS	**EXISTING VERBS – CORRECT NON-SIG.**
8-9-year-olds vs. adults	*t(20)=2.57, p=0.018, d=1.10*
7-8-year-olds vs. adults	*t(22)=3.56, p=0.002, d=1.37*
6-7-year-olds vs. adults	*t(24)=4.96, p<0.001, d=1.83*
5-6-year-olds vs. adults	*t(22)6.89, p<0.001, d=2.67*
4-5-year-olds vs. adults	*t(18)=5.32, p<0.001, d=2.38*
3-4-year-olds vs. adults	*t(22)=10.72, p<0.001, d=4.29*

For novel verbs, the most common response was the sigmatic past tense form, whether these rhymed with existing sigmatic or existing non-sigmatic

forms. On the contrary, rhyme played a bigger role on the formation of the novel verbs that rhymed with existing non-sigmatic verbs. This means that rhyme facilitates the formation for novel verbs with respect to the non-sigmatic condition.

With respect to developmental changes, older children produced more correct sigmatic forms than younger children, as there was a difference of 43.53% in performance between the oldest and the youngest group (see Table 6.10). However, the difference in the production of sigmatic forms between the two conditions was bigger in the sigmatic condition only in the two oldest child groups and the adult group. This means that, the adult native speakers and the two oldest child groups (from 7 to 9 years old) produced more sigmatic forms in the novel verbs that rhymed with existing sigmatic verbs than in the novel verbs that rhymed with existing non-sigmatic verbs. This was not the case for the youngest child groups (from 3 to 7 years old), who were less consistent in their production of sigmatic forms across the two conditions (see Table 6.10 for the sigmatic condition and Table 6.11 for the non-sigmatic condtion). In addition, the older the group the higher the percentages of non-sigmatic forms in the non-sigmatic condition (from 2.78% for the 3-4-year-olds to 20% for the adult group).

Table 6-10: Mean percentages of the production of sigmatic, non-sigmatic and other forms for novel verbs rhyming with existing sigmatic verbs (modified, Stavrakaki and Clahsen 2009: 127)

GROUPS	**SIGMATIC CONDITION**		
	Sigmatic	Non-sigmatic	Other
Adults	*92*	*1*	*7*
8-9-year-olds	*87.50*	*4.17*	*8.33*
7-8-year-olds	*80*	*5*	*15*
6-7-year-olds	***80.32***	*3.39*	*16.29*
5-6-year-olds	***71.78***	*1.43*	*26.78*
4-5-year-olds	***69.75***	*2.11*	*28.14*
3-4-year-olds	***43.97***	*0*	*56.03*

Table 6-11 Mean percentages of the production of sigmatic, non-sigmatic and other forms for novel verbs rhyming with existing non-sigmatic verbs (modified, Stavrakaki and Clahsen 2009: 127)

GROUPS	**NON-SIGMATIC CONDITION**		
	Non-sigmatic	Sigmatic	Other
Adults	***20***	*73*	*7*
8-9-year-olds	***11.02***	*70.65*	*18.33*
7-8-year-olds	***12.86***	*72.85*	*14.28*
6-7-year-olds	***4.62***	***80.28***	*15.10*
5-6-year-olds	***3.3***	***87.95***	*8.75*
4-5-year-olds	***10.11***	***67.95***	*21.94*
3-4-year-olds	***2.78***	***52.63***	*44.59*

A two-way ANOVA revealed significant main effects of group (*F (6, 77) =6.48, p<0.00*) and condition (*F (1, 77) =326.83, p<0.00*) but no significant interaction effect (*F (6, 77) =1.33, p=0.26*). In other words, all participants produced more sigmatic than non-sigmatic forms despite rhyme similarity. This was related to age in that the younger the group the less predictable the answers due to the fact that the younger child groups produced sigmatic forms for novel verbs that rhymed with existing non-sigmatic verbs. Overall, application of the sigmatic form starts early on in life as opposed to non-sigmatic, which are mostly used by older children and adults.

Similar results were found for non-rhyming novel verbs and the sigmatic past tense form. The latter was everyone's first preference in forming the non-rhyming novel verbs. In addition, all groups used the sigmatic past tense form more for the non-rhymes than for novel verbs that rhymed with existing non-sigmatic verbs, while there was an increase in the use of the sigmatic past tense form in the older child groups and the adult group (from 39.48% for the 3-4-year-olds to 80.83% for the 8-9-year-olds and 91% for the adult group). One-way ANOVA revealed a significant main effect of group (*F (6, 77) =5.24, p<0.00*), while the two youngest child groups were the only groups to differ significantly from the adult group (*4-5-year-olds vs. adults: t (18) =3.63, p=0.02, d=1.62*; *3-4-year-olds vs. adults: t (16) =4.893, p=0.00, d=2.4*).

To summarise the results of the production task, the sigmatic past tense form was the most common response for all participants. Interestingly, all age

groups generalised the sigmatic past tense form to existing verbs that rhymed both with the sigmatic and the non-sigmatic condition, while rarely was the non-sigmatic past tense form generalised to anything other than the existing verbs that rhymed with the non-sigmatic condition. However, the sigmatic past tense form was also preferred for non-rhyme novel verbs. Therefore, the sigmatic past tense form was generalised regardless rhyme similarity, while the non-sigmatic past tense form was sensitive to rhyme similarity and rarely generalised beyond it.

Overall results of the acceptability judgement task resembled those of the production task. It is worth noting at this point that participants never used the option of producing a third alternative in case they disagreed with the two available options. With respect to the existing verbs, performance rose with age (from 52% for the 3-4-year-olds to 97.5% for the 8-9-year-olds), while it was slightly higher in the sigmatic than in the non-sigmatic condition. A two-way ANOVA revealed significant main effects of group (*F (6, 92) =26.44, p<0.00*) and condition (*F (1, 92) =5.95, p=0.02*) but no significant interaction between group and condition (*F (6, 92) =0.695, p=0.65*). Comparisons between each child group and the adult group revealed that only the two oldest groups approached adult-like accuracy in both conditions, while differences between the other four groups (from 3 to 7-year-olds) and the adult group were statistically significant with large effects sizes (see Tables 6.12 and 6.13).

Table 6-12 Comparison between the child groups and the adult group for existing sigmatic verbs in the acceptability judgement task

GROUPS	SIGMATIC CORRECT
8-9-year-olds vs. adults	*t(35)=1.39, p=0.191, d=0.57*
7-8-year-olds vs. adults	*t(34)=1.61, p=0.138, d=0.69*
6-7-year-olds vs. adults	*t(36)=2.46, p=0.03, d=0.97*
5-6-year-olds vs. adults	*t(41)=6.13, p<0.00, d=2.04*
4-5-year-olds vs. adults	*t(33)=10.23, p<0.00, d=4.58*
3-4-year-olds vs. adults	*t(33)=13.37, p<0.00, d=5.98*

Table 6-13 Comparison between the child groups and the adult group for existing non-sigmatic verbs in the acceptability judgement task

GROUPS	NON-SIGMATIC CORRECT
8-9-year-olds vs. adults	*t(35)=1.38, p=0.175, d=0.45*
7-8-year-olds vs. adults	*t(34)=1.68, p=0.122, d=0.70*
6-7-year-olds vs. adults	*t(36)=3.68, p=0.00, d=1.37*
5-6-year-olds vs. adults	*t(41)=5.48, p<0.00, d=1.81*
4-5-year-olds vs. adults	*t(33)=6.08, p<0.00, d=2.64*
3-4-year-olds vs. adults	*t(33)=9.84, p<0.00, d=4.23*

Performance in novel rhymes was similar to the one during the production task. All participant groups showed a preference for the sigmatic past tense form, even when novel verbs rhymed with existing non-sigmatic verbs. On the contrary, the non-sigmatic past tense form was chosen only when the target form rhymed with existing non-sigmatic verbs. A two-way ANOVA

revealed significant main effects of group (*F (6, 92) =4.70, p<0.00*) and condition (*F (1, 92) =148.84, p<0.00*), as well as a significant interaction effect (*F (6, 92) =11.58, p<0.00*). In this case, only the oldest child group (8-9-year-olds) reached adult-like levels, while the three youngest groups presented the largest differences from the adult group (see Tables 6.14 and 6.15).

Table 6-14 Comparison between the child groups and the adult group for novel rhymes in the acceptability judgement task – Sigmatic form/condition

GROUPS	**SIG. FORM/CONDITION**
8-9-year-olds vs. adults	*t(35)=0.40, p=0.68, d=0.15*
7-8-year-olds vs. adults	*t(34)=3.08, p=0.00, d=1.14*
6-7-year-olds vs. adults	*t(36)=2.88, p=0.01, d=1.04*
5-6-year-olds vs. adults	***t(41)=5.01, p<0.00, d=1.60***
4-5-year-olds vs. adults	***t(33)=6.66, p<0.00, d=2.45***
3-4-year-olds vs. adults	***t(33)=8.03, p<0.00, d=3.18***

Table 6-15 Comparison between the child groups and the adult group for novel rhymes in the acceptability judgement task – Non-sigmatic form/condition

GROUPS	**NON-SIG. FORM/CONDITION**
8-9-year-olds vs. adults	*t(35)=1.13, p=0.26, d=0.42*
7-8-year-olds vs. adults	*t(34)=2.27, p=0.03, d=0.81*
6-7-year-olds vs. adults	*t(36)=2.69, p=0.01, d=0.9*
5-6-year-olds vs. adults	***t(41)=3.70, p=0.00, d=1.15***
4-5-year-olds vs. adults	***t(33)=2.93, p=0.00, d=1.09***
3-4-year-olds vs. adults	***t(33)=2.15, p=0.04, d=0.82***

With regard to non-rhymes, children from the age of 5 and the adult group showed a preference for the sigmatic past tense form with the adults and the oldest child group providing the highest number of responses. The responses of children below the age of 5 were inconsistent. A one-way ANOVA revealed a main effect of group (*F (6, 92) =18.47, p<0.00)*. The sigmatic past tense form was the first preference in all conditions: sigmatic rhymes, non-sigmatic rhymes, and non-rhymes. On the other hand, rarely was the non-sigmatic past tense form preferred for anything other than novel verbs which rhymed with existing non-sigmatic verbs. Therefore, sigmatic forms can generalise beyond their similarity domain as opposed to non-sigmatic forms, which are rhyme-sensitive.

Overall, the researchers identified four patterns. Firstly, both children and adults widely generalised the sigmatic form to novel verbs in the elicited production task, while during the judgement task that was the case for adults and only children from the age of five. Younger age groups were not consistent in their responses. Secondly, children overapplied the sigmatic form to existing non-sigmatic verbs, while the novel non-sigmatic rhyme forms presented similarities with existing non-sigmatic verbs. Finally, non-sigmatic rhymes rarely generalised into sigmatic forms. Development also played a role in the acquisition of the PPT in L1 Greek, since the youngest children scored lower in the non-sigmatic than in the sigmatic verbs. Only the two eldest child groups produced adult-like results during the judgement task. This can be explained by the ‘irregular’ nature of the non-sigmatic

verbs, whose acquisition needs to be achieved gradually on an item-by-item basis.

6.6 Modern Greek as a Second Language

Clahsen et al. (2010) conducted a follow-up study, where they looked at the acquisition of the PPT by adult learners of Greek. The researchers implemented the same methodology as in their first study, with the exception that the follow-up study also included exposure to writing. There were four tasks: an oral and a written production task, and an oral and a written acceptability judgement task. The aim of this study was to compare findings with those of past studies, as well as to test theories of inflectional morphology in adult L2 learning.

There are three theoretical accounts, which derive from the challenges that adult L2 learners face regarding the application of inflectional morphology. One of these accounts is the Missing Surface Inflection (Haznedar, 2001; Haznedar, 2003; Haznedar and Schwartz, 1997; Lardiere, 1998a, b, 2000; Prévost and White, 2000a, b), where it is argued that the adult L2 learner's difficulty lies in the actual production of morphology. Although learners might possess the relevant theoretical knowledge, they encounter difficulties in production due to the anxiety that a communicational situation potentially causes.

The second account, or 'failed functional features' hypothesis, attributes the lack of target-like use of inflectional morphology to deficits in syntactic

representation, i.e. incomplete acquisition of the relevant structure. Hawkins and Chan (1997) support the existence of a critical period during which the learner can acquire the functional features. After childhood, these features are not accessible to learners who begin their language learning in adulthood due to the inability to set new options already fixed in the L1 (ibid: 189). However, there is the option of mapping new material on to morpho-phonological features. Therefore, these arguments produce two possible outcomes: firstly, the L2 learner might never notice the differences between the two languages and might produce language similar to the L1 or, secondly, the learner might notice and produce language different from that of the L1. However, that language will not be the same as the one of the native speaker of the L2. Nonetheless, this account assumes that the fewer contrasts there are between the L1 and the L2, the better the learner will perform. Thus, speakers of languages that present similarities with the morphological patterns of Greek are expected to perform better than speakers whose L1 lacks inflectional morphology.

The third and final account for the differences that occur between L1 and L2 speakers is the fact that L2 learners memorise morphologically complex words as new lexicon and are not usually able to analyse the internal structure of a word like native speakers do, i.e. to break down the word by following the relevant grammatical rules. Ullman's (2005) explanation is that adult L2 learners rely more on declarative memory as opposed to native speakers, who rely more on procedural memory. Declarative memory is when the learner is conscious about his or her knowledge and can explicitly

recall it, while procedural memory is when the learner has gained knowledge inconsciously through repetition. Knowledge stored in procedural memory is automatically and unconsciously retrieved.

To test the production-specific issue of the Missing Surface Inflection account, the researchers tested their participants through different modalities (speaking and writing), while for the 'failed functional features' hypothesis participants were tested in PPT forms that differed morphologically. Finally, generalisation properties, especially overapplications, were also tested in order to identify whether L2 learners indeed rely on lexical storage more than native speakers do.

The L2 learners were 153 adults with different L1 backgrounds, such as Albanian, English, Arabic, and Chinese. They were all first exposed to Greek between the ages of 16 and 25, and were living in Greece at the time of the study. To measure the participants' proficiency, the researchers used the written Greek language proficiency test created by the Greek Language Teaching Centre at the University of Athens. The test examines grammar, vocabulary and reading comprehension. Level was determined based on the Common European Framework of Reference (CEFR). The intermediate group's mean test score ranged from 51.6% to 55.95% and the advanced group's from 75.37% to 80.93%. The control group consisted of 85 adult native speakers of Greek. For the oral and written production tasks, the L1 data from Stavrakaki and Clahsen (2009) were taken, while new L1

participants were recruited for the oral and written judgement tasks. The researchers replicated the methodology of the L1 study.

The accuracy scores of the L2 learners on existing verbs were lower (sigmatic: 90.26%; non-sigmatic: 65.65%) than those of the native speakers (sigmatic condition: 100%; non-sigmatic condition: 97%) in the oral production task, while the L2 groups' performance on the sigmatic condition was significantly better than on the non-sigmatic condition (L2 intermediate: $t\ (21) = 6.69,\ p=0.00;$ L2 advanced: $t\ (15) = 3.64,\ p=0.05$). A 2 x 2 ANOVA revealed significant main effects of group (L2 intermediate: $F\ (1, 30) = 24.54,\ p<0.00;$ L2 advanced: $F\ (1, 24) = 9.25,\ p<0.05$) and condition (L2 intermediate: $F(1, 30) = 23.11,\ p<0.00;$ L2 advanced: $F(1, 24) = 10.56,\ p<0.00$), and significant interactions between group and condition (L2 intermediate: $F\ (1, 30) = 15.61,\ p<0.00;$ L2 advanced: $F(1, 24)=5.00,\ p<0.05$). Between-group comparisons showed that the advanced group performed significantly better than the intermediate group on the non-sigmatic condition ($t\ (36) = 2.75,\ p<0.05$), which was not the case for the sigmatic condition ($t\ (36) = 1.53,\ p=0.13$).

In the oral production of novel verbs, the most common response was the sigmatic past tense form especially for sigmatic rhymes and non-rhymes but also for novels rhyming with existing non-sigmatic verbs. On the contrary, non-sigmatic forms were mostly applied to non-sigmatic rhymes. A 3 x 2 ANOVA on the percentages of sigmatic responses in the three conditions revealed a marginal effect of group for the Intermediate L2 group ($F\ (1, 30)$ =

4.04, p = 0.05) but no significant effect for the Advanced L2 group (*F (1, 24) = 1.65, p=0.21*). Main effects of condition were found to be significant for both groups (L2-intermediate vs. L1: *F (2, 60) =13.84, p<0.00;* L2-advanced vs L1: *F (2, 48) =14.76, p<0.00*) but there were no significant interactions between group and conditions. Overall, the L2 learners had lower scores on non-sigmatic forms but advanced L2 learners were better than intermediate learners on existing non-sigmatic verbs.

During the written production task for existing verbs, L2 learners scored lower on non-sigmatic than sigmatic verbs. 2x2 ANOVAs revealed main effects of group (L2-intermediate: *F (1, 43)=198.78, p <0.01;* L2-advanced: *F (1, 43)=54.87, p<0.01*) and condition (L2-intermediate: *F (1, 43)=52.25, p<0.01;* L2-advanced: *F (1, 43)=50.81, p<0.01*), as well as significant group by condition interactions (L2-intermediate: *F (1, 43)=47.13, p<0.01;* L2-advanced: *F(1, 43)=44.73, p<0.01*). Both groups performed significantly better on existing sigmatic verbs (L2-intermediate: *t (19) =6.42, p<0.05;* L2-advanced: *t (19) =6.36, p<0.05*). With respect to novel verbs, there was a general preference for sigmatic forms from both groups. In the L1 group, there were fewer sigmatic forms for non-sigmatic rhymes than for sigmatic rhymes and non-rhymes, a contrast that was less evident for the L2 learners. 3 x 2 ANOVAs generated marginal effects of group (L2-intermediate: *F(1, 43)=2.31, p=0.14;* L2-advanced: *F (1, 43)=3.07, p=0.07*) but statistically significant effects of condition (L2-intermediate: *F (2, 86) =79.68, p<0.01;* L2-advanced: *F (2, 86)=64.1, p<0.01*), and significant group by condition

interactions (L2-intermediate: *F (2,86) =20.99, p<0.01;* L2-advanced: *F(2, 86)=22.68, p<0.01*).

In the oral judgement task, the L2 groups had lower accuracy scores than the L1 group, while the former scored significantly lower on the non-sigmatic than in the sigmatic condition of existing verbs (L2-intermediate: *t (20) =7.12, p<0.00;* L2-advanced: *t (14) =2.86, p<0.05)*. The intermediate learners scored lower than the advanced learners especially on the non-sigmatic condition (sigmatic condition: *t (34) = 2.36, p<0.05;* non-sigmatic condition: *t (34) =3.52, p<0.05*). 2x2 ANOVAs revealed main effects of group (L2-intermediate: *F (1, 44)=41.28, p<0.00;* L2-advanced: *F (1, 38)=11.86, p<0.05*) and condition (L2-intermediate: *F (1, 44) = 56.20, p<0.00;* L2-advanced: *F(1, 38)=15.44, p<0.00*), as well as significant group by condition interactions (L2-intermediate: *F(1, 44)=29.77, p<0.00;* L2-advanced: *F(1, 38)=4.48, p<0.05*).

With respect to novel verbs, there was a clear preference of sigmatic over non-sigmatic forms in sigmatic and non-rhyme conditions, which was more prominent in the L2 groups. 3x2 ANOVAs showed main effects of group (L2-intermediate: *F (1, 44) =20.82, p<0.00;* L2-advanced: *F (1, 38) =11.45, p<0.00*) and condition (L2-intermediate: *F (2, 88) =58.43, p<0.00;* L2-advanced: *F (2, 76) =41.80, p<0.00*) but no significant interaction. Both L1 speakers and L2 learners generalised the sigmatic form.

During performance on existing verbs in the written judgement task, the L1 group scored higher than the L2, while the advanced L2 learners had higher accuracy scores than the intermediate L2 learners (sigmatic condition: *t (37) =2.11, p<0.05*; non-sigmatic condition: *t (37) =2.99, p<0.05*). The intermediate learners performed better on the sigmatic than on the non-sigmatic condition (L2-intermediate: *t(19)=2.78, p<0.05)*. 2x2 ANOVAs revealed main effects of group (L2-intermediate: *F(1, 43)=44.38, p<0.01;* L2-advanced: *F (1, 42)=24.75, p<0.01*) and condition (L2-intermediate: *F(1, 43)=10.17, p<0.05;* L2-advanced: *F(1,42)=3.01, p=0.09*), as well as a significant group by condition interaction only for the intermediate L2 group (L2-intermediate: *F(1, 43)=9.1, p<0.05;* L2-advanced: *F(1, 42)=2.15, p=0.15*).

For novel verbs, both L1 and L2 learners showed a preference for the sigmatic form both for sigmatic and non-rhyme conditions. However, both L2 groups scored higher in producing sigmatic forms for novels which rhymed with existing non-sigmatic verbs. 3x2 ANOVAs revealed a main effect of group for the intermediate group only (*F(1, 43)=6.3, p<0.05*), main effects of condition (L2-intermediate: *F(2, 86)=58.84, p<0.01*; L2-advanced: *F(2, 84)=78.68, p<0.01*) and significant group by condition interactions (L2-intermediate: *F(2, 86)=30.15, p<0.01;* L2-advanced: *F(2, 84)=25.12, p<0.01*).

To summarise, findings showed that the L2 learners often replied with imperfective past tense forms, especially in non-sigmatic verbs (e.g. *kóntene* ‘she was shortening’ instead of *kóntine* ‘she shortened’). The L2 learners also performed poorer in non-sigmatic than in sigmatic verbs in both

experiments. In the novel sigmatic and non-rhyme verbs, the oral experiments showed that L2 learners rely more on non-sigmatic forms than native speakers do. These findings have implications for the theoretical accounts mentioned earlier, i.e. the Missing Surface Inflection account, the 'failed functional features' account, and Pinker's (1999) 'words-and-rules' model.

The Missing Surface Inflection referred to the L2 learners' difficulties of applying inflectional morphology in speech due to pressures caused by language production. Indeed, the L2 learners often replied with imperfective forms across conditions, which could be considered an 'omission' error of the sigmatic suffix *-s-*. The Impf of sigmatic verbs is considered to be easier than the PPT because the stem of the verb in the Impf is the same as the stem of the Simple Present tense (e.g. ***péft****-o* 'I fall' becomes *é-****peft****-a* 'I was falling', instead of *é-****pe****-****s****-a* 'I fell'). Thus, the learner keeps the Simple Present stem of the verb and adds the past tense endings, which are the same for all past tenses in Greek.

This omission of the inflectional suffix supports the Missing Surface Inflection theory regarding the production-specific problem that the L2 learners face due to limitations in communication. These errors were also found on the judgement tasks, indicating that lack of production of inflectional affixes applies to comprehension and grammaticality judgement equally. As for the 'failed functional features' account, where incomplete acquisition of the target feature is partly due to the existence of that feature in the L1, the data did not

support this theory. Speakers of languages with and without the perfective/imperfective aspect performed equally well.

Finally, the data partially supported the third account, which argues that adult L2 learners memorise complex words as vocabulary chunks. The adult L2 learners overgeneralised non-sigmatic forms, which was not the case with the native adult speakers and children. Considering that irregular forms might be stored as lexicon, this is an indication that the L2 learners rely on patterns more than children and adult native speakers do.

In another study, Cañas (2014) looked at the acquisition of the PPT by Catalan and Spanish learners of Greek. The aim was to find out whether learners make fewer errors as their proficiency level rises, as well as whether they overgeneralise irregular forms less often at a higher proficiency level. Similar to Stavrakaki and Clahsen (2009), Cañas also tested the single versus dual mechanism debate in order to find out whether regular and irregular past verbs are processed in the same way ('single mechanism account') or through two distinct cognitive mechanisms ('dual mechanism account').

Cañas identified nine categories for irregular verbs based on Triandafillidis (1993: 231-233). He tested the participants on two out of the nine categories. Category 1 consisted of verbs that form a completely different word in the past tense (e.g. *vlépo* 'I see' becomes *ída* 'I saw'). Category 9 consisted of verbs that form the PPT by adding the suffixes *–esa, -isa,* and *-asa* when the

target verb belongs in the verb category named ‘contract’. These verbs end in *–áo* in the infinitive form (e.g. *geláo* ‘I laugh’ becomes *gél**asa*** ‘I laughed’; *foráo* ‘I wear’ becomes *fór**esa*** ‘I wore’). The aim was to look at any overapplications of the regular past tense form (*e*+stem+*sa*) to the above irregular categories.

The 28 adult participants (mean age: 47.6 years) came from the Official School of Languages of Barcelona ‘Drassanes’. Nine learners attended summer schools in Greece and 7 lived in the country, while all of them held academic degrees. The study took place in the school classrooms and it started with a questionnaire on the demographic and linguistic information of the participants. Next, participants were tested on a Grammaticality Judgement Test (GJT), which contained 20 sentences on the correctness of the irregular verbs in the PPT. The test was created based on what was taught at the school and what was discussed in meetings with the teachers. All of the learners were timed with a time limit of 10 minutes. Finally, two learners from each level (10 in total) participated in the oral protocols, where the researcher investigated the learners’ choices on overgeneralisation. One learner had a linguistic background while the other did not. The learners had to answer three questions: why any incorrect sentences were said to be correct, why a correct sentence was said to be incorrect and questions on any sentences left unanswered.

Results supported the first research question, confirming that the number of overgeneralisations drops as the proficiency level of the learner rises. More

specifically, learners who were exposed to the past tense for the first time overgeneralised more than the rest of the learners (*M*=6.2 number of errors). However, in level 2, the average number of errors dropped (*M*=4.1) both due to instructional and naturalistic input during visits in Greece. Surprisingly, there was an increase in the number of errors in level 3 (*M*=5.8), which the researcher attributed to the older age of the group (between 45 and 60 years of age). On the contrary, the learners in level 4 made fewer overgeneralisations (*M*=1.6) possibly due to their increased proficiency level. Finally, there is a slight increase in the number of overgeneralisations for learners in level 5 compared to level 4 (*M*=2.7). The relationship between proficiency and number of errors turned out statistically significant (Kruskal-Wallis: $\chi 2=11.383$; $df=4$; *Asymp.* $p=0.02$).

The second research question asked whether findings supported any of the given theoretical accounts, i.e. the single or the dual mechanism account. The researcher argued that results supported the dual mechanism account for two reasons. Firstly, it took the participants more time to provide answers for the irregular forms than for the regular ones. Only two participants from the highest levels (4 and 5) provided all irregular verbs, while two from level 3 and one from level 2 could only find some of the irregular forms. Interestingly, no participant from level 1 was able to produce any irregular forms, supporting the hypothesis that level of proficiency is related to accuracy. Secondly, the average time the participants needed to complete the GJT lessened as the level increased. Participants in levels 1, 2 and 3 needed more time to complete the test (*M*=4.8, 4.7 and 5 respectively) than

participants in levels 4 and 5 (*M*=4.2 and 2.9), indicating that it takes less time for learners with higher proficiency levels to retrieve these irregular forms from memory.

6.7 Conclusion

The studies of Stavrakaki and Clahsen (2009) and Clahsen et al. (2010) found that both L1 speakers and L2 learners of Greek perform better in the sigmatic than in the non-sigmatic condition, while there was a tendency to generalise the sigmatic form to different kinds of novel verbs. Children overgeneralised the sigmatic form to novel verbs that rhymed with existing non-sigmatic verbs. However, there were no overgeneralisations of the non-sigmatic form to novel verbs rhyming with existing sigmatic verbs. In the follow-up study, the learners of Greek did not achieve a native-like performance even at an advanced level of proficiency. In addition, writing caused difficulties to the learners, who achieved lower accuracy scores and more imperfective past tense responses than in the oral tasks. Thus, the PPT might be more difficult to produce in writing due to the discrepancies occurring in formation between the Simple Present and the target tense. At the same time, orthographic overlap between the Impf and the Simple Present might be the reason why there were more imperfective responses in the writing tasks. Cañas' (2014) study confirmed that higher proficiency levels contribute to the production of more accurate responses, as well as to the decrease of overgeneralisation errors. He also found that the stay-abroad factor plays an important role in the accurate acquisition of the PPT.

However, the above findings are based on the highly educated population. Thus, they cannot be generalised to learners who have not received an education or had to learn the L2 without receiving any formal instruction. For this reason, I replicated Clahsen et al.'s (2010) study by looking at the accuracy in the oral production of the PPT by low educated adult learners of Greek. What follows next is the findings of Experiment 2 on the low educated learners.

Chapter 7 – Experiment 2[19]

Methodology, Results and Discussion

7.1 Introduction

In this chapter, I introduce and present the results for Experiment 2. Experiment 2 tested three grammatical measures in L2 Greek: singular agreement, plural agreement, and past tense marking. The aim of this experiment was to investigate the accuracy with which learners of Greek produce these features in naturalistic language with respect to their literacy levels in the L1. In other words, I looked at whether level of literacy in the L1 influenced the accuracy of oral production. For this reason, I compared the performance of two groups, which differed in literacy (operationalised as number of years of formal education). That is to say, I focused specifically on the possibility that being literate supports acquisition by enhancing the ability to attend to form. This is to support Tarone et al.'s (2009) findings that learners with high academic attainment, and thus highly analytical skills, have better chances of noticing morphology, and consequently producing more complex speech, than learners with low academic attainment. This is because alphabetic print literacy makes available decoding skills which influence oral processing.

In addition to testing the role of literacy on L2 attainment, I also tested a second variable, namely input, which is the language that the learner potentially processes (Sharwood Smith 1993). Input clearly plays a crucial

[19] The findings of Experiment 2 were published in Janko et al. (2019).

role in both L1 and L2 language acquisition. However, the extent to which input affects ultimate L2 language attainment is a matter of some controversy (e.g. see Flege 2009; Birdsong 2006; Birdsong and Mollis 2001; DeKeyser et al. 2010; Johnson and Newport 1989). Whatever stand one takes in this controversy, it is clear that acquiring a high level of proficiency requires a large amount of input.

I hypothesized that education would facilitate attention to form and hence lead to better attainment of grammatical distinctions with relatively low functional load, particularly when these are complex. Quantity of input would be most strongly associated with aspects of language which are most relevant to communication, and in particular, fluency. I analysed spontaneous speech samples in order to measure fluency, grammatical complexity, and lexical richness. Therefore, the IVs were L1 literacy, operationalised as number of years of formal schooling, and input, operationalised as length of residence (LoR) in the host country. The DVs were the percentage of correct responses for the grammatical and the proficiency measures.

In this chapter, I first present the methodological approach, results and discussion of Experiment 2. I outline the research design, including the sample, procedure, coding, scoring, and analytical approach. I conclude with the results and discussion on the findings of Experiment 2.

7.2 Research Approach and Design

Since this is an exploratory study, I examined a variety of linguistic measures. First, I analysed spontaneous speech samples to obtain more measures of fluency, grammatical complexity and lexical richness. In addition, I conducted elicitation tasks which probed the L2 speakers' mastery of singular and number agreement in the noun phrase and the ability to produce perfective past tense forms. Such obligatory yet largely redundant grammatical markers have been repeatedly shown to be particularly difficult for L2 learners, even in English with its relatively impoverished morphology (see Clahsen et al. 2010; Konta 2012a; Stavrakaki and Clahsen 2009).

To elicit both controlled and free speech, Experiment 2 consisted of four tasks: singular agreement (Task 2); plural agreement (Task 3); spontaneous speech (Task 4); and past tense marking (Task 5). All tasks tested oral production. Participants were asked to read three short texts in Albanian in order to measure their literacy (see Appendix I). I implemented this broad measurement of literacy, as it was very difficult to find an appropriate alphabetic literacy assessment measure for Albanian. The assessment was based on Tarone et al. (2009), who observed the learner's behaviour while doing the task, while my participants were also recorded reading the texts out loud.

In all language tasks (2, 3 and 5), participants produced controlled speech based on the pictures presented to them. More specifically, in Task 2,

participants were tested in all three genders, i.e. masculine (1), feminine (2), and neuter (3). The noun phrases were in the accusative case.

1. **Τον πράσινο πίνακα.**
   Ton *prásino* *pínaka*
   The-M.SG.ACC green-M.SG.ACC board-M.SG.ACC
   'The green board'.

2. **Την κόκκινη πόρτα.**
   Tin *kókini* *pórta*
   The-F.SG.ACC red-F.SG.ACC door-F.SG.ACC
   'The red door'.

3. **Το κίτρινο πουκάμισο.**
   To *kítrino* *poukámiso*
   The-N.SG.ACC y yellow-N.SG.ACC shirt-N.SG.ACC
   'The yellow shirt'.

In Task 3, the same stimuli were used but in the plural number. Example 4 is masculine plural; example 5 is feminine plural; and example 6 is neuter plural.

4. **Τους πράσινους πίνακες.**
   Tous prásinous pínakes.
   The-M.PL.ACC green-M.PL.ACC board-M.PL.ACC
   'The green boards'.

5. **Τις κόκκινες πόρτες.**
   Tis kókines pórtes.
   The-F.PL.ACC red-F.PL.ACC door-F.PL.ACC
   'The red doors'.

6. **Τα κίτρινα πουκάμισα.**
   Ta kítrina poukámisa.
   The-N.PL.ACC yellow-N.PL.ACC shirt-N.PL.ACC
   'The yellow shirts'.

Table 7.1: Summary of basic Greek functional morphology – Singular & Plural agreement

	Task 2- Singular Agreement	Task 3 – Plural Agreement
Masculine	Most representative endings: '-os' and '–as'; Determiner and adjective come before noun; All components of the noun phrase agree in gender and number with the noun; Gender and number agreement does not mean phonological match between endings (e.g. *o prásin**os** pínak**as*** 'the green board')	Most representative endings: '-I' (-οι) and '–es'; Determiner and adjective come before noun; All components of the noun phrase agree in gender and number with the noun; Gender and number agreement does not mean phonological match between endings (e.g. *i* (-οι) *prásin**i*** (-οι) *pínak**es*** 'the green boards')
Feminine	Most representative endings: -i and –a; Determiner and adjective come before noun; All components of the noun phrase agree in gender and number with the noun; Gender and number agreement does not mean phonological match between endings (e.g. i *kókin**i** pórt**a*** 'the red door').	Most representative ending: -es; Determiner and adjective come before noun; All components of the noun phrase agree in gender and number with the noun (e.g. i (-οι) *kókines pórtes* 'the red doors').
Neuter	Most representative endings: -i and –o; Determiner and adjective come before noun; All components of the noun phrase agree in gender and number with the noun (e.g. *to kítrino poukámiso* 'the yellow shirt').	Most representative ending: -a; Determiner and adjective come before noun; All components of the noun phrase agree in gender and number with the noun (e.g. *ta kítrina poukámisa* 'the yellow shirts').

In both tasks, pictures were used as stimuli to elicit speech. Figure 7.1 is an example of Task 2, while Figure 7.2 is an example of Task 3.

Figure 7-1 Experiment 2 - Task 2 - Singular Agreement

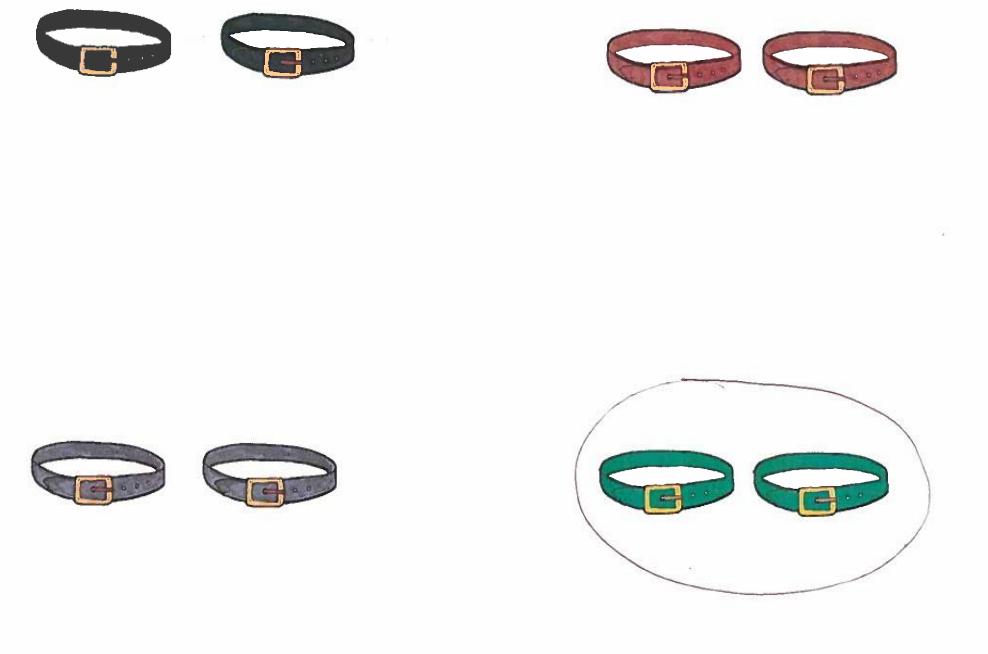

Figure 7-2 Experiment 2 - Task 3 - Number Agreement

The participant and the experimenter each had a notebook. For the singular agreement task, every page in the notebook contained a sample of four pictures depicting objects of the same kind which differed in colour (e.g. four belts). In the participant's notebook, one of the objects was circled (cf. see Figure 1). The participant's task was to ask the researcher to show them the target item. To achieve this, the participant had to utter the sentence *Ðíkse mou* 'Show me' followed by the target noun phrase (e.g. *tin prásini zóni* 'the green belt', where the determiner *tin* and the adjective *prásini* agree with the noun *zóni* in both gender and number) (see Example 7 for singular agreement and Example 8 for number agreement). The plural agreement task was exactly the same, except that the pictures contained four pairs of identical objects (see Figure 7.2).

7. **Δείξε μου *το κόκκινο μπαλόνι*.**
   Ðíkse mou *to* *kókino* *balóni*
   Show me the-N.SG.ACC red-N.SG.ACC balloon-N.SG.ACC.
   'Show me the red balloon'.

8. **Δείξε μου *τα κόκκινα μπαλόνια*.**
   Ðíkse mou *ta* *kókina* *balónia*
   Show me the-N.PL.ACC red-N.PL.ACC balloon-N.PL.ACC
   'Show me the red balloons'.

The researcher's task was to point at the target picture each time. The rationale behind this task was based on Eisenbeiss' (2009) form-focused elicitation technique with children. This co-player task is used to obtain data for a specific grammatical structure or a combination of structures that would normally take more time to produce through free spontaneous speech.

Task 4 measured language proficiency by asking participants to produce spontaneous speech in the L2. The participants were asked to discuss a familiar topic, such as their hometown, family, work, or how they learned Greek. Some participants chose a topic and started talking, while others had to be told which topic to discuss. There were participants who were not as willing as others to discuss in depth, in which case I had to ask questions to elicit speech. There were also participants who spoke only for a few minutes either because they did not have enough free time or because they were not willing to share any more information. Lack of time and trust is one of the risks working with people who are not used to being approached by scholars. Thus, individual samples varied in length from 114 to 360 words.

Task 5 tested past tense production and was based on the work of Clahsen et al. (2010) (see Chapter 6, section 6.6 for more details). In this task, participants were presented with pairs of pictures depicting an ongoing (Figure 7.3) and a completed action (Figure 7.4). In each trial, I described the first picture (e.g. *Edó to pedí halái to pehnídi* 'Here the child is breaking the toy') and then pointed to the second picture and asked what the agent had done (e.g. *Edó to pedí ti ékane?* 'Here the child did what?') in order to elicit a sentence containing a perfective past tense form (e.g. *To pedí/aftós hálase to pehnídi* 'The child/he broke the toy.')

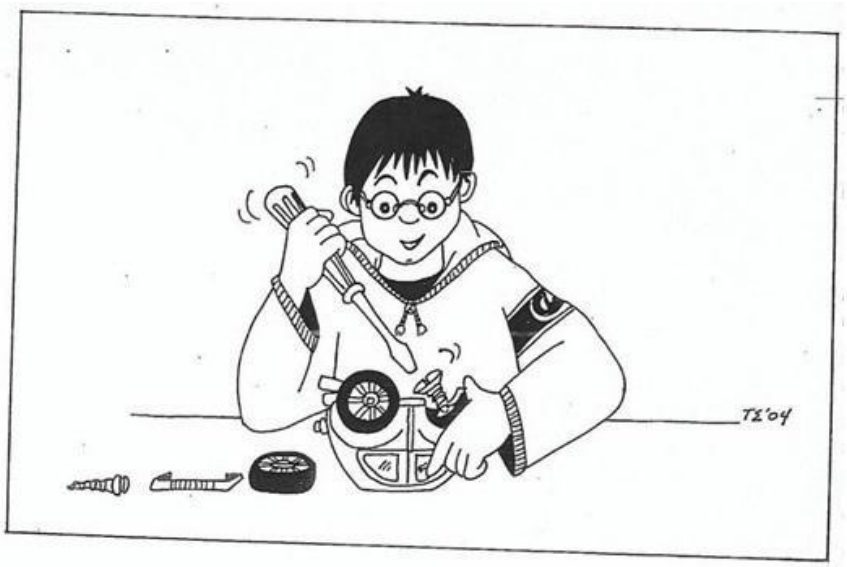

Figure 7-3 Experiment 2 - Task 4 - Example of picture with on-going event for the perfective past tense (Clahsen et al. 2010)

Figure 7-4 Experiment 2 - Task 4 - Example of picture with completed event for the perfective past tense (Clahsen et al. 2010)

Table 7.2: Summary of the Experiment 2 tasks

Task 1	To read out loud three short texts in Albanian, for literacy measurement
Tasks 2 & 3: singular & plural agreement	Three genders: masculine, feminine and neuter Separate notebooks for participant and researcher Each page contained four pictures with the same objects but in different colours (see fig. 7.1 for the singular and fig. 7.2 for the plural) Participants produced key phrase by asking the researcher to show them the circled item each time (see example 7 for the singular and example 8 for the plural).
Task 4	Spontaneous speech production to measure L2 proficiency by discussing a familiar topic
Task 5: past tense oral production	Participants were presented with pairs of pictures: one with an ongoing action and the other with a completed one. The researcher described the first picture and asked the participant what the agent had done in the second one.

To make the task more manageable, I chose three out of the five conditions used in Clahsen et al's (2010) original study: existing sigmatic verbs, existing non-sigmatic verbs and novel verbs which do not rhyme with any existing verb. The purpose of the two conditions that were removed, i.e. the novel sigmatic rhymes and the novel non-sigmatic rhymes, was to test (over)generalisation with respect to the two verb conditions. In other words, Clahsen et al.'s aim was to see whether rhyme would influence the

participants' responses in the formation of the novel verbs. However, this was not the focus of the current study. The rationale for keeping the 10 non-rhyming novel verbs was to look at participants' tendencies in assigning and forming novel verbs without, however, these verbs reminding them of any existing ones. In other words, by excluding novel verbs that rhymed with existing verbs, I made sure that the participants' responses were an indication of their ability to generalise the target regular form to novel verbs.

The focus of the current experiment is on the learners' production of oral language, which is why I used the oral version of Clahsen et al.'s elicited production task. Oral tasks with picture description are one of the most suitable tasks for testing learners that have not received any formal schooling in the L2. Pictures are one of the few stimuli a researcher can use in the absence of the written mode. In addition, the grammaticality judgement task was not appropriate for what this experiment tests, which is the accuracy in the production of specific grammatical phenomena by groups that differ in their literacy levels. In grammaticality judgement tasks, participants are already provided with the testing items and are simply asked to judge the grammaticality of the sentence. Another, mostly practical, reason for not using the grammaticality judgement task was the fact that I would need the double amount of participants. Similar to Clahsen et al. (2010), no one participant could take part in both tests.

7.2.1 Participants

The sample of participants was made up of 49 native speakers of Albanian (23 females and 26 males) learning Greek as a second language in a naturalistic setting in Greece. None of them had attended courses in Greek as a foreign language. 33 of the participants knew the Greek alphabet, and some could read single words and a few could read simple sentences; however, none could read or write Greek fluently. Length of residency in Greece (LoR) varied from 8 to 27 years (*M*=20.6, *MED*=21); age at the time of testing from 30 to 69 years old (*M*=52, *MED*=54); age of arrival from 16 to 49 years old (*M*=30, *MED*=31); and full-time education in the native language from 4 to 16 years (*M*=9.2, *MED*=9.0). Tables 7.3 and 7.4 that follow show this information for the low- and the highly-educated participants respectively.

Table 7.3: Information about the Low-educated Participants – Experiment 2

Participant	Education	AoA	Age at Testing	LoR	NS Interaction
L13	4	39	60	21	1
L14	4	49	69	20	0
L20	4	39	59	20	0
L2	5	37	57	20	2
L5	5	23	31	8	0
L6	6	34	42	8	2
L9	6	29	55	26	0
L10	6	33	54	21	2
L11	6	24	45	21	0
L12	6	30	56	26	2
L19	6	39	59	20	2
L21	6	21	41	20	0
L24	6	23	45	22	1
L3	7	30	50	20	1
L17	7	42	63	21	0
L1	8	35	54	19	0
L4	8	34	59	25	2
L7	8	34	58	24	1

L8	8	35	58	23	1
L15	8	46	66	20	0
L16	8	44	65	21	0
L18	8	34	60	26	2
L22	8	38	60	22	2
L23	8	33	57	24	1

Explanatory note: AoA=Age of Arrival; LoR: Length of Residence; NS Interaction=native-speaker interaction, where '0' is for interaction with Greeks and Albanians, '1' is for interaction with Greeks and '2' is for interaction with Albanians.

In the low-educated group, 38% interacted both with Greeks and Albanians, 29% interacted more with Greeks and 33% with Albanians.

Table 7.4: Information about the Highly-educated Participants–Experiment 2

Participant	Education	AoA	Age at Testing	LoR	NS Interaction
H20	9	16	36	20	1
H6	10	20	40	20	2
H8	10	23	45	22	0
H16	10	16	35	19	0
H19	10	21	32	11	0
H23	11	17	41	24	0
H1	12	44	64	20	0
H3	12	31	51	20	0
H4	12	18	38	20	0
H5	12	31	55	24	0
H7	12	19	30	11	0
H9	12	34	61	27	0
H10	12	21	47	26	0
H11	12	23	42	19	1
H12	12	16	37	21	1
H13	12	30	55	25	0
H14	12	28	49	21	2
H15	12	17	41	24	0
H17	12	26	34	8	2
H21	12	29	48	19	0
H22	12	31	53	22	0
H24	12	37	63	26	1
H18	14	16	34	18	2
H25	14	36	60	24	1
H2	16	45	68	23	2

In the highly educated group, 60% interacted equally with Greeks and Albanians, 20% mostly with Greeks and the other 20% mostly with Albanians.

All the participants were informed of their rights before participating in the study and provided their written consent. Data collection took place in Athens, Greece, between May and July 2017. Each participant was tested either at their own house or at a quiet nearby café, where I was always accompanied by a family member.

7.2.1.1 The Participants' L1: Albanian

Albanian is a synthetic language, i.e. it uses inflections to show the syntactic relationships in a sentence, making it similar to Greek and other Indo-European languages. Among others, it inflects nouns, adjectives, determiners, and verbs.

Nouns are marked for gender, number, case and definiteness. There are two genders, masculine and feminine (as opposed to Greek, neuter has almost disappeared), and two numbers, singular and plural. The plural formation is highly irregular, with different suffixes and internal stem changes. The Albanian system distinguishes five cases: nominative, genitive, dative, accusative and ablative. However, it is worth pointing out that the genitive and dative are always the same, while the vocative occurs in limited cases only. The locative case is not present in standard Albanian, while the dative and the ablative are identical except for the indefinite plural of some nouns.

Thus, most cases are similar despite them being numerous. The definite and indefinite forms of the noun are shown by the presence or absence of a postpositive definite article right after the noun, e.g. *djal* ‘boy’ becomes *djal**i*** ‘the boy’ due to the addition of *–i*. These vary with gender and case, while gender is known from the definite form (Camaj, 1984). The two languages differ in this aspect in that Greek only has one definite article, which in turn precedes the noun.

Modifier phrases also follow the noun (Morgan, 1984). This could be a particle whose form depends on the agreement properties of the head noun. The rest of the modifier phrase could be an adjective (see examples 1 and 2 below) or a noun phrase functioning as a possessor (see examples 3 and 4).

1. Djali	i	mirë
Diáli-N.MSC.SG.NOM.DEF	i-MSC.SG.NOM.DEF	mir-ADJ. MSC.SG.NOM.DEF
Boy-the	[particle]	good
‘the good boy’		

2. Djem	të	mirë
Diém-N..MSC.SG.NOM	të- MSC.SG.NOM	mir-ADJ. MSC.SG.NOM
Boys	[particle]	good
‘good boys’		

3. Vajza	e	kryetarit
Váïza-N.FEM.SG.NOM.DEF	e-FEM.SG.NOM.DEF	krietárit-N.MSC.SG.OBL.DEF
Daughter-the	[particle]	president-of-the
‘the daughter of the president’		

4. Vajzavet	të		kryetarit
Váïzavet-N.FEM.PL.OBL.DEF	të-FEM.PL.OBL.DEF		krietárit-N.MSC.SG.OBL.DEF
Daughters-the	[particle]		president-of-the
‘the daughters of the president’			

The particle in (3) and (4) agrees with the head noun to the left. However, when the modifier phrase is in a predicate position and a particle occurs, the latter agrees with the head noun in the predicate (see example 5).

5. Djali	është	i	zgjuar
Diáli-N.MSC.SG.NOM.DEF	ësht-V.3SG.PRS	i-MSC.SG.NOM.DEF	zgiuar-ADJ.MSC.SG.NOM
Boy-the	be-	[particle]	smart
‘The boy is smart’			

Adjectives are also marked for gender and number but not for case, as opposed to Greek where adjectives are marked for all three features. Most adjectives follow the noun either directly (*djali nervoz* ‘the irritable boy’) or are preceded by a connective particle (*djali i vogël* ‘the little boy’; class-2 adjectives). Adjectives hold different endings based on this particle, which agrees with the noun in gender, case, definiteness and number (Campos, 2009). I expect that the L2 learners will have acquired singular and plural agreement due to the input received over the years but also considering that the Albanian nominal system seems to be more complex than the Greek one.

Similar to Greek, the Albanian verb system is marked for person, number, tense, voice and mood, while there are two general types of conjugations. In the active voice, the indicative present, imperfect (past continuous) and aorist (simple past) alter morphologically, while all other combinations of moods, aspects and tense are formed periphrastically by using the auxiliary *kam* 'have'.

Both languages have past tenses and the inflectional system is quite complex, with numerous stem changes and inflectional subclasses. However, one important difference is that Albanian does not make a distinction between Perfective and Imperfective aspect (Varlokosta 2002). That is, unlike in the Greek language, the Present, the Past and the Plusperfect are used more or less interchangeably. For this reason, I predict that the L2 learners will have a tendency to produce more imperfective forms, but also because the imperfective requires less stem changes than the perfective in Greek.

7.2.2 Materials

7.2.2.1 Singular and Number Agreement

The agreement tasks were a modified version of the tasks used by Konta (2012a, 2013b) (see Chapter 4, section 4.2 for a more detailed description). The focus of her study was also on the production of oral skills by children, which makes some of the materials more suitable for low educated learners than the materials used in other studies. This is because child native speakers are expected to be at the same level with beginner L2 learners.

There were some differences between Konta's study and the current study. Firstly, my participants were adult L2 learners. Secondly, they were not exposed to any writing. In addition, the testing items were not provided to them; they had to establish the correct vocabulary on their own. These factors combined with the low education factor make the task more demanding than the one in Konta's study.

Based on these differences, not all testing nouns were appropriate for my participants. Similar to Experiment 1, all the testing items of the current study were inanimate, which is why I only assigned the property of colour to them (see Appendix J, Table J1 for a list of the excluded nouns due to animacy). Inanimate items, such as 'statue' and 'mirror', were also excluded because it was difficult to assign the property of colour to them (see Appendix J, Table J2). After conducting a pilot study with native speakers of Greek, I excluded 8 more items that were visually ambiguous as to what they were (e.g. 'fabric') (see Appendix J, Table J3). This was not an issue in Konta's study, as the researcher provided her participants with the vocabulary. Finally, because Konta's study was for children, some items appeared non-relevant to an adult population, while others were excluded because they were found phonologically challenging for the less educated group. The excluded items were *koubarás* 'piggy bank', *ouranoksístis* 'skyscraper', and *ipologhistís* 'computer'.

Due to the aforementioned differences, I reduced the initial number of items from 64 in Konta's study to 24 in the current experiment (see Appendix K,

Tables K1 and K2 for a list with the final testing items for singular and number agreement respectively). The practice items were 12 with 4 items per gender (see Appendix L, Tables L1 and L2 for singular and number agreement respectively). The noun phrases consisted of a definite determiner, an adjective and a noun (e.g. *i kókini bála* 'the red ball'). Both agreement tasks tested all three genders, with 8 items per gender, giving a total of 24 items. For each gender, I chose nouns with the most frequent endings, based on data provided by Mastropavlou and Tsimpli (2011): *-os* and *-as* for masculine nouns (e.g *tíhos* 'wall' and *anaptíras* 'lighter'), *-i* and *-a* for feminines (e.g. *zóni* 'belt' and *pórta* 'door'), and *-i* and *-o* for neuters (e.g. *balóni* 'balloon' and *vivlío* 'book').

With respect to adjectives, three colour terms were included in Experiment 2: *kókino* 'red', *prásino* 'green' and *kítrino* 'yellow'. The main reason I chose these three colours was because they are marked for agreement when followed by a noun (e.g. *kókin**i** pórta* 'red door' in the feminine becomes *kókin**o** paráθiro* 'red window' in the neuter). This is not the case for all colour adjectives in Greek. For instance, colours like *ble* 'blue', *mov* 'purple', and *roz* 'pink' are invariant regardless of gender or number.

There are three more colour adjectives marked for agreement: *galázio* 'light blue', *gkri* or *gkrízo* 'grey', and *áspro* 'white'. However, these adjectives are not part of the main colour spectrum and might cause semantic ambiguity to the learners. Thus, they were not included in the current experiment. In short, *kóqino* 'red', *prásino* 'green', and *kítrino* 'yellow' are part of the main

spectrum, which helps to avoid any semantic ambiguity, and were the most appropriate colours for object description.

7.2.2.2 Perfective Past Tense

There were 48 items for the past tense production task: 30 testing items (10 existing sigmatic, 10 existing non-sigmatic, and 10 non-rhyming novel verbs), 8 practice items, and 10 filler items (see Appendix H). Within each condition, there were three sub-classes. The first sigmatic sub-class consisted of three verbs, which belong to the first conjugation and which form the active perfective by replacing the labial consonant *-f-* at the end of the stem with the cluster *–ps–* (e.g. *gráfo* 'I write' becomes *égrapsa* 'I wrote') (for a detailed description of the stem changes, see Appendix G, Table G1).

The second sigmatic subclass consisted of four verbs, which also belong to the first conjugation. All four verbs form the past tense by replacing the last consonant or cluster of the stem with the sigmatic suffix. Two out of four verbs ended in the same consonant (*-n-* after a vowel), while the stems of the other two verbs had different endings. The stem of *pláθo* 'I make by hand' ends in the dental consonant *-θ-*, while the stem of *péfto* 'I fall' ends in a cluster containing a labial (*-ft-*). Considering stem ending, *péfto* belongs to the first sigmatic subclass. However, it does not form its active perfective with the cluster *–ps–*, like *gráfo* 'I write' which becomes *égrapsa* 'I wrote'. According to the rules (see Chapter 6, section 6.4), *péfto* 'I fall' should become **épepsa*. Instead, its correct past tense form is *épesa*. This discrepancy might be due to what follows after the labial consonant *–f–*. In

gráfo, *–f–* is followed by the first person ending *–o*, which is a vowel, while in *péfto* *–f–* is followed by the consonant *–t–*. Holton et al. (2004) classify *péfto* as an irregular, while Stavrakaki and Clahsen (2009) consider it regular due to the presence of the *–s–* suffix. These discrepancies even among regular verbs, along with the differing statements of scholars on which verbs are regular or not, show the challenges learners face when they encounter past tense formation.

The third sigmatic subclass consisted of three verbs known as 'contracted' because the ending *–áo* in the first person Present tense is contracted to *–ó* (e.g. *kouvaláo/kouvaló* 'I carry'). These verbs belong to the second conjugation. The particularity of these verbs is that they differ in the way they form the past tense despite the *–s–* suffix. *Tripó* 'I bore' and *kouvaló* 'I carry' become *trípisa* 'I bored' and *kouválisa* 'I carried' respectively, while *haló* 'I spoil' becomes *hálasa* 'I spoiled'. The past forms differ in the vowel added each time between the stem and the *–s–* suffix. Although these verbs are part of Clahsen et al.'s third sigmatic subclass due to their sigmatic suffix *–s–*, Cañas (2014) argues that they are one of nine categories of irregular verbs based on Triandafillidis (1993: 231-233).

Table 7.2: Summary of existing sigmatic ('regular') verb formation rules

Subclasses	**Examples**
1. First conjugation verbs: labial consonant *–f–* at the end of the stem, replaced by the cluster *–ps–*	*Gráfo* 'I write' becomes é*grapsa* 'I wrote'

2. First conjugation verbs: last consonant or cluster of stem, replaced with the sigmatic suffix *–s–*	*Lí**n**o* ‘I untie’ becomes *éli**s**a* ‘I untied’
3. Second conjugation verbs: past forms differ in the vowel added each time, followed by the *–s–* suffix	*Tripó* ‘I bore’ becomes *trípi**s**a* ‘I bored’, as opposed to *haló* ‘I break’ which becomes *hál**a**sa* ‘I broke’.

The non-sigmatic condition also consisted of three subclasses. The first subclass consisted of the only three verbs in Greek which present a completely different word in the past tense from the Present tense (e.g. *tróo* ‘I eat’ becomes ***éfaga*** ‘I ate’). The second non-sigmatic sub-class consisted of four verbs. The stem of the first three of the verbs ended in *–rno*, which means that the *–n-* is eliminated and the thematic vowel *–**é**–* is replaced by the vowel *–i–*. However, only two of the target verbs replace the thematic vowel: *sp**é**rno* ‘I seed’ becomes *éspi**i**ra* ‘I seeded’ and *j**é**rno* ‘I bend’ becomes *éj**i**ra* ‘I bent’. Instead, *f**é**rno* ‘I bring’ becomes *éf**e**ra* ‘I brought’ without changing the thematic vowel.

The fourth verb in the second non-sigmatic class, ***pléno*** ‘I wash’, is an interesting case. It gives the impression of a first conjugation verb because its stem is stressed on the last vowel and ends in *–n–* preceded by a vowel, so it could be part of the second sigmatic subclass (like *líno – éli**s**a* ‘I untie – I untied’ and *díno – édi**s**a* ‘I dress – I dressed’). However, *-n-* remains intact and is not replaced by the *–s–* to form the active perfective. Thus, it breaks the most important rule of sigmatic verbs. The reason it belongs to this non-

sigmatic sub-class is because of its similarity to the other verbs of the subclass (*spérno* 'I seed' and *jérno* 'I bend') regarding the thematic vowel change from *–e– to –i–*. Therefore, instead of **éplisa* (based on *élisa* 'I untied'), *pléno* 'I wash' becomes *éplina* 'I washed'.

The third non-sigmatic subclass consists of three verbs, which end in *–éno* (e.g. *zest**éno*** 'I warm'). However, two of them form the active perfective with *–an–* (*zest**éno*** 'I warm' becomes ***zéstan**a* 'I warmed' and *if**éno*** 'I weave' becomes *if**an**a* 'I wove'), while the third verb forms the active perfective with *–in–* (*kont**éno*** 'I shorten' becomes *kónt**in**a* 'I shortened'[20]).

Table 7.3: Summary of existing non-sigmatic ('irregular') verb formation rules

Subclasses	**Examples**
1. Present tense form differs from past tense form	*Tróo* 'I eat' becomes é*faga* 'I ate'
2. With verbs ending in *–rno*, the *–n–* is eliminated; the vowel *-é-* before *–rno* is replaced by *-i-*	*Sp**é**rno* 'I seed' becomes *esp**i**ra* 'I seeded' *J**é**rno* 'I bend' becomes *éj**i**ra* 'I bent' **Exceptions**: *F**é**rno* 'I bring' becomes *éf**e**ra* 'I brought' *Pl**é**no* 'I wash' becomes *épl**i**na* 'I washed'
3. Verbs ending in *–éno* but forming the active perfective with a different vowel	*Zest**é**no* 'I warm' becomes ***zést**ana* 'I warmed' *If**é**no 'I weave'* becomes *if**a**na* 'I wove' *Kont**é**no* 'I shorten' becomes *kónt**i**na* 'I shortened'

[20] For more details on other active perfective suffixes of the same verb category, see Holton et al. (2004: 144-45).

Overall, the above formation rules show the complexity of the past tense formation in Greek, even among the so called “regular” verbs. Thus, there is no doubt that, in order to form it, the L2 learners of Greek need to take into consideration numerous factors.

7.2.3 Procedure

I met with each participant once, and the experiments lasted between thirty to forty-five minutes. All meetings were recorded using a digital voice recorder. The instructions were provided both orally and in writing in Greek unless the participant asked for an explanation in Albanian. Each elicitation task was preceded by practice trials. The session started with an interview during which participants provided information about their age, gender, full-time education in the L1, years of residence in Greece, whether they had received any education in Greece, knowledge of languages other than the L1 and the L2, reading time per week, knowledge of writing in the L2, and interaction with native speakers of Greek. The interview was followed by the reading task, the agreement tasks, the spontaneous speech task, and the past tense production task, in that order.

In Task 1, the participants read the three short texts in Albanian. Task 2 was the first language task, where participants were tested on singular agreement through the oral description of pictures. This was followed by a similar task in number agreement (Task 3). Task 4 was the spontaneous speech task, where my participants produced free speech. The majority was usually unrestrained and talked about themselves in general. In cases where

participants were not that eloquent or open, I asked questions to help them feel more comfortable (e.g. how it was growing up in Albania or how they learned Greek). Finally, in Task 5, the participants were tested in the past tense, where they produced controlled speech through picture description.

7.2.4 Data Coding and Scoring

In the three grammar tasks (singular agreement, number agreement and past tense production), responses were coded as correct or incorrect. The DV for the grammar tasks was the percentage of correct responses, while for the spontaneous speech task it was the results from the measures of fluency, grammatical complexity and lexical richness. In the agreement tasks, I coded determiner-noun agreement and adjective-noun agreement separately. For the novel verbs, the regular (i.e., sigmatic) form was considered the target. More specifically, the grammatical measures were:

- singular determiner agreement,
- singular adjective agreement,
- plural determiner agreement,
- plural adjective agreement,
- past sigmatic,
- past non-sigmatic,
- And novel past forms.

And the proficiency measures were:

- Pauses to fluent speech ratio
- Speech rate
- Mean length of Terminable unit

- Clausal density
- Type to token ratio
- Lexical density

The spontaneous speech samples were used to calculate the following measures:

- Pauses to fluent speech ratio: This is a measure of fluency computed by dividing the number of pauses by the number of fluent segments and multiplying by 100. A fluent segment was defined as intonational unit.
- Speech rate: This was a second measure of fluency and was computed by dividing the total number of words by the total speech time in seconds and multiplying the result by 60 (Grosjean 1980; in Götz 2013), which yields the mean number of words per minute.
- Mean length of T-unit (MLTU): This is a global measure of syntactic complexity. A 'Terminable unit' (T-unit) is a unit consisting of an independent clause and any subordinate clauses or non-finite fragments that are attached to it (Hunt 1970; Götz 2013). Thus, the utterance *I started learning English when I was 11* consists of one T-unit, while *I am supposed to meet my friends this evening but the weather is very bad* consists of two T-units. MLTU, the mean length of T-unit in words, is widely used as a measure of syntactic complexity beyond the preschool years (see, for example, Götz 2013; Nippold et al. 2005; Scott 1988).

- Clausal density (also known as subordination index): This measures the amount of subordination in a sample. It is computed by dividing the number of clauses by the number of T-units (Götz 2013; Nippold et al. 2005; Scott 1988).
- Type to token ratio (TTR): This is a widely used measure of lexical diversity computed by dividing the number of word types in the sample by the number of word tokens (Johansson 2008). A higher ratio means that fewer word types are repeated, and hence that the sample is more lexically diverse.
- Lexical density: This measures the density of information. It is calculated by dividing the number of content words (nouns, adjectives, verbs and adverbs) by the total number of words and multiplying the result by 100.

During the broad literacy measurement task, my participants read out loud the short texts belonging to three different bands of reading. To measure literacy, I followed Tarone et al.'s (2009) rubric, where they ranked the participants' behaviours on a scale from 1 to 9 with '9' being the highest score. These ranks related to 3 rating scales for reading fluency, 3 for writing, and 3 for confidence. Because I did not test my participants' writing skills, I ranked them on a scale from 1 to 6, i.e. 3 rating scales for reading fluency and 3 rating scales for confidence (see Table 7.4). Thus, I did not include the scale for writing in this research project. Those who scored from '1' to '3' were added in the less educated group, while those who scored from '4' to '6' were added in the more educated group.

Table 7-4: Literacy rating scale for reading task - Experiment 2 (Tarone et al. 2009[21])

Rating	***Native language***	
	Reading fluency	***Confidence***
1	Follows with pen; much sub-vocalisation; slow speed; retraces/backtracks; asks researcher for help.	Expresses reluctance to read; may say cannot do it.
2	Starts out slowly and then speeds up, still showing some difficulty in decoding; may follow with pen or finder and/or sub-vocalise; often read twice, much faster the second time.	Will try, but not very sure of skills; asks questions along the way.
3	Very comfortable; little sub-vocalisation; speed relatively quick.	Approaches task without hesitation.

The central aim of this experiment was to establish the extent to which fluency, grammatical complexity and accuracy and lexical knowledge are predicted by literacy (operationalised as the number of years in full-time schooling) and input (operationalised as length of residence), as well as examining any possible interactions between these two factors. With respect to length of residence, those participants with less than 10 years of residence in Greece were added in the 'shorter' LoR group, while those with 10 or more years of residence were in the 'longer' LoR group. The rationale was based on past research findings, where some studies have shown that it is unlikely

[21] The researchers also considered comprehension difficulty by asking their participants questions about the texts. However, I did not consider 'comprehension' while measuring their literacy, so I did not ask them any questions on the texts.

for L2 performance to be influenced after 10 years of residence in the host country (e.g. Bylund et al. 2012; DeKeyser et al. 2010). However, other studies, where the mean LoR was longer than 10 years, have correlated it with L2 performance (e.g. Abrahamsson 2012; Flege 2009; Granena and Long 2013; Saito 2013). Thus, it will be interesting to see whether LoR longer than 10 years will have an effect on L2 performance. 'Shorter' LoR was scored for '1' and 'longer' for '2'.

I expected that both education and input would predict L2 achievement. However, I predicted that education would be particularly relevant for the acquisition of "decorative" grammar, i.e. those aspects of grammar which contribute relatively little to meaning, and especially when these are complex and/or irregular: that is to say, I predicted a stronger relationship between education on the one hand and agreement marking and especially past tense marking on the other. By contrast, input should be a better indication for fluency measures.

7.2.5 Data analysis

I performed a series of factorial analysis of variance (ANOVA) to determine differences between groups with accuracy and proficiency scores as the DVs, and group and input as the IVs. I also ran the post-hoc test LSD[22] to lower the chances of Type I error, which is suitable for when each IV consists of four levels of less. My IVs consisted of two levels (group: low vs high;

[22] *Least Significant Difference.*

length of residence: short vs long). All differences were reported as significant at p<.05 or higher.

Experiment 2 data were analysed based on the grammatical measures of singular agreement, number agreement, and past tense formation, and on the proficiency measures of fluency, grammatical complexity, and lexical richness. I used the statistical software SPSS version 24. What follows next is the results and discussion sections of Experiment 2.

7.3 Results

7.3.1 Grammatical Accuracy Measures

The descriptive statistics are presented in Table 7.5. The upper part of the table (above the horizontal line in the middle) presents the descriptive statistics for grammatical accuracy, i.e. the elicitation tasks, whereas the lower part of the table (below the horizontal line in the middle) presents the descriptive statistics for the proficiency measures, i.e. the spontaneous speech task. The linguistic measures are arranged from easiest (singular determiner agreement) to most difficult (past tense of novel verbs). It is clear from these figures that the grammar tasks differ in difficulty, with mean scores ranging from 23% correct for the past tense of novel verbs to 91% for singular determiner agreement. Furthermore, although there is a good range of variation on all measures, a considerable proportion of participants performed at ceiling (100% correct) on the agreement tasks and at floor (0% correct) on the past tense production task.

For singular determiner agreement, the lowest score was 66%, with 32 out of the 49 participants performing at ceiling. For singular adjective agreement and plural determiner agreement, 27 participants scored 100% correct; and for plural adjective agreement, 20 participants. For past tense inflection, the scores were considerably lower, with no participant performing at ceiling. Eight participants (all with no more than 8 years of schooling) failed to produce a single correct form of an existing non-sigmatic verb, and 18 participants (15 of whom had no more than 8 years of schooling) failed to produce a single correct form of a novel verb. This is an indication that level of education affected the performance of these learners, especially in past tense formation. Finally, for singular determiner agreement and singular adjective agreement, there is no effect. This is most likely due to ceiling effects, as my participants achieved scores of 91% and 87% correct respectively for these measures.

Table 7-5 Mean, median, range and Interquartile range for all measures

	Mean	Median	Range	IQR
Sg Det Agr	91	100	66-100	78-100
Sg Adj Agr	87	100	60-100	71-100
Pl Det Agr	87	100	44-100	73-100
Pl Adj Agr	78	76	44-100	60-100
Past Sigm	55	60	10-90	40-80
Past Nonsigm	38	40	0-90	20-60

Nonce Past	23	20	0-60	0-50
PausesToFluentSegments	54	55	43-68	50-58
SpeechRate	56	56	33-67	52-60
MLTU	8.96	8.40	4.11-20.14	6.92-9.70
ClausalDensity	1.22	1.19	1.00-1.89	1.10-1.27
TTR	.76	.77	.32-.96	.69-.85
LexicalDensity	38.6	37.8	25.9-59.7	33.2-43.0

Explanatory note: The figures for the grammatical accuracy measures (agreement and past tense production) are percentages of target responses. For details about the remaining measures, please see the Data Coding and Scoring section above.

To examine the role of Education (group), Input (LoR), and their possible interactions on variables of interest, i.e. the proficiency and grammatical measures, I divided the learners into two groups: the less and the more educated learners. LoR was divided in shorter (up to 10 years) and longer (from 11 onwards). Tables 7.6 and 7.7 show the means and standard deviations of the grammatical accuracy measures for both groups.

Table 7-6 Mean percentages (and standard deviations) of agreement in Experiment 2

		Grammatical	*measures*	*of agreement*	
		SgDet Agr	*SgAdj Agr*	*PlDet Agr*	*PlAdj Agr*
Group	*LoR*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
LowEd	*ShortLoR*	*100 (0)*	*100 (0)*	*63 (11)*	*63 (11)*
	LongLoR	*89 (15)*	*84 (16)*	*86 (17)*	*72 (18)*

HighEd	*ShortLoR*	*100 (0)*	*100 (0)*	*90 (10)*	*85 (13)*
	LongLoR	*92 (13)*	*89 (14)*	*89 (14)*	*85 (18)*

Explanatory note: SgDetAgr (singular determiner agreement); SgAdjAgr (singular adjective agreement); PlDetAgr (plural determiner agreement); PlAdjAgr (plural adjective agreement).

Table 7-7 Mean percentages (and standard deviations) of past tense marking in Experiment 2

		Grammatical measures of Past Tense		
		Past Sigm	*Past Non-sigm*	*Past Nonce*
Group	*LoR*	*M (SD)*	*M (SD)*	*M (SD)*
LowEd	*ShortLoR*	*50 (14)*	*20 (0)*	*5 (7)*
	LongLoR	*38 (29)*	*18 (18)*	*5 (8)*
HighEd	*ShortLoR*	*80 (0)*	*70 (0)*	*50 (0)*
	LongLoR	*70 (19)*	*56 (25)*	*40 (19)*

Explanatory note: PastSigm (existing past sigmatic); PastNonsigm (existing past non-sigmatic); PastNonce (nonce non-rhyming verbs in the sigmatic form).

The grammatical accuracy measures are arranged from easiest (SgDetAgr) to most difficult (PastNonce). For five of the accuracy measures (determiner number agreement, adjective number agreement, existing sigmatic verbs, existing non-sigmatic verbs, and nonce verbs), education was the only factor with a main effect on performance.

For singular determiner agreement, the two groups had similar scores (LowEd: ShortLoR *M=100%,* LongLoR *M=89%*; HighEd: ShortLoR *M=100%,* LongLoR *M=92%*). A 2 (group) x 2 (LoR) ANOVA did not reveal a main effect of group (F (1, 45) =0.046, p = 0.8, *partial* η^2 = 0.001) or of LoR (F (1, 45)

=1.246, p = 0.3, *partial* η^2 = 0.027), nor was there any interaction effect (ShortLoR: F (1, 45) =0.000, p = 1, *partial* η^2 = 0.000; LongLoR: F (1, 45) =0.834, p = 0.4, *partial* η^2 = 0.018). This was possibly due to ceiling effects, as both groups scored higher than 89% on singular determiner agreement.

For singular adjective agreement, although some scores were slightly lower, the two groups achieved very high scores (LowEd: ShortLoR *M=100%,* LongLoR *M=84%*; HighEd: ShortLoR *M=100%,* LongLoR *M=89%*). A 2 (group) x 2 (LoR) ANOVA did not reveal a main effect of group (F (1, 45) =0.090, p = 0.8, *partial* η^2 = 0.002) or of LoR (F (1, 45) =2.100, p = 0.2, *partial* η^2 = 0.045), nor was there any interaction effect (ShortLoR: F (1, 45) =0.000, p = 1, *partial* η^2 = 0.000; LongLoR: F (1, 45) =1.640, p = 0.2, *partial* η^2 = 0.035). This was possibly due to ceiling effects, as both groups scored higher than 84% on singular adjective agreement. Figure 7-5 below provides a visual representation of singular agreement between the two groups.

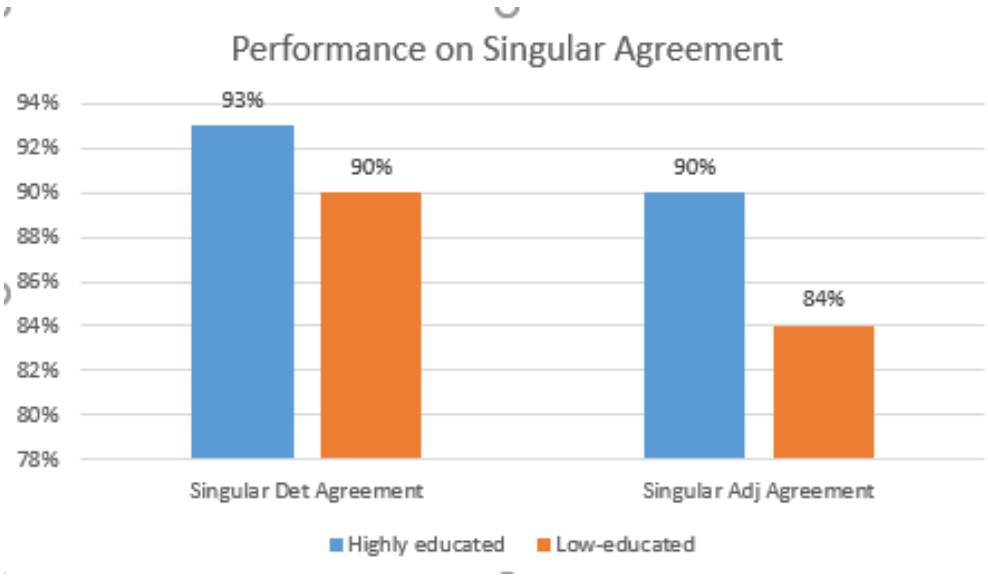

Figure 7-5: Performance of the two groups on singular agreement

For plural determiner agreement, the scores were lower than in the singular agreement task. The more educated group scored higher than the less educated group, where learners with a longer LoR achieved a higher score (LowEd: ShortLoR *M=63%,* LongLoR *M=86%)*. In the more educated group, the scores of the sub-groups were similar (HighEd: ShortLoR *M=90%,* LongLoR *M=89%*). A 2 (group) x 2 (LoR) ANOVA revealed a main effect of group with a large effect size (F (1, 45) =4.151, p = 0.48, *partial* η^2 = 0.084) but no main effect of LoR (F (1, 45) =0.363, p = 0.6, *partial* η^2 = 0.008). There was no interaction effect.

A similar pattern was detected in the scores for plural adjective agreement, where the more educated group achieved higher scores. However, contrary to the less educated group, the scores were the same in the more educated group regardless of LoR (LowEd: ShortLoR *M=63%,* LongLoR *M=72%*; HighEd: ShortLoR *M=85%,* LongLoR *M=85%*). A 2 (group) x 2 (LoR) ANOVA revealed a main effect of group with a large effect size (F (1, 45) =5.063, p = 0.03, *partial* η^2 = 0.101) but no main effect of LoR (F (1, 45) =0.076, p = 0.8, *partial* η^2 = 0.002). There was an interaction effect with a large effect size for participants with a long length of residence (ShortLoR: F (1, 45) =2.843, p = 0.1, *partial* η^2 = 0.059; LongLoR: F (1, 45) =6.800, p = 0.01, *partial* η^2 = 0.131). This means that length of residence contributed to the acquisition of adjective number agreement only for the more educated group. Figure 7-6 below provides a visual representation of plural agreement between the two groups.

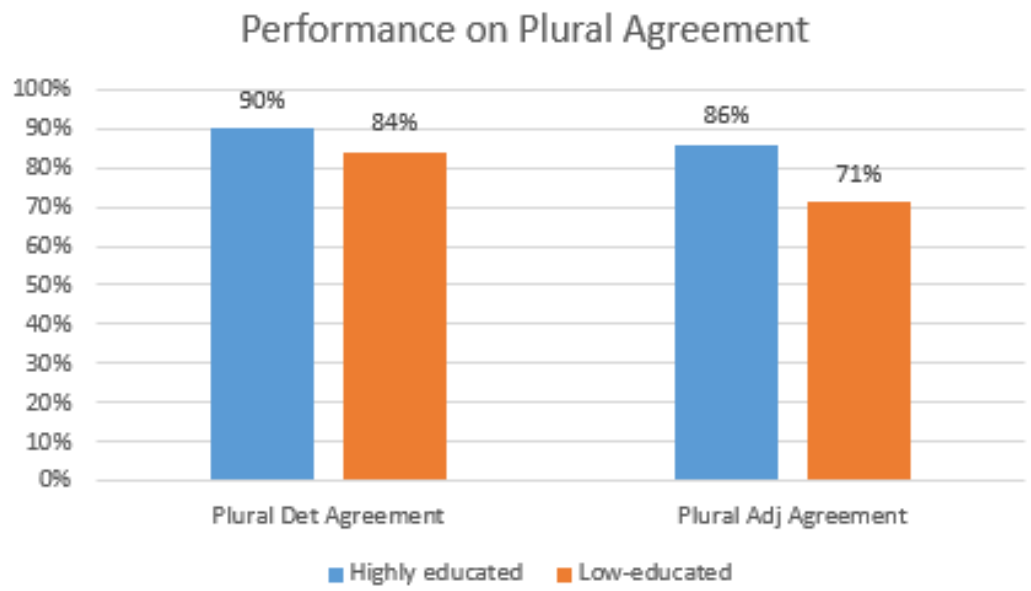

Figure 7-6: Performance of the two groups on plural agreement

For past sigmatic verbs, the less educated group had lower scores than the more educated group (LowEd: ShortLoR *M=50%,* LongLoR *M=38%*; HighEd: ShortLoR *M=80%,* LongLoR *M=70%*). A 2 (group) x 2 (LoR) ANOVA revealed a main effect of group with a large effect size (F (1, 45) =4.956, p = 0.03, *partial* η^2 = 0.099) but no main effect of LoR (F (1, 45) =0.602, p = 0.4, *partial* η^2 = 0.013). There was an interaction effect with a large effect size for participants with a long length of residence (ShortLoR: F (1, 45) =1.201, p = 0.3, *partial* η^2 = 0.026; LongLoR: F (1, 45) =24.551, p = 0.00, *partial* η^2 = 0.353). The learners with a longer length of residence seem to produce more answers that are correct than those with a shorter length of residence.

For past non-sigmatic verbs, the more educated group achieved higher scores than the less educated group, while the ShortLoR sub-group of the more educated group achieved a higher score than the LongLoR group

(LowEd: ShortLoR *M=20%,* LongLoR *M=18%*; HighEd: ShortLoR *M=70%,* LongLoR *M=56%*). A 2 (group) x 2 (LoR) ANOVA revealed a main effect of group with a large effect size (F (1, 45) =10.518, p = 0.002, *partial* η^2 = 0.189) but no main effect of LoR (F (1, 45) =0.350, p = 0.6, *partial* η^2 = 0.008). There was an interaction effect with a moderate effect size for participants with a long length of residence, while the interaction effect approached significance with a moderate effect size for participants with a short length of residence (ShortLoR: F (1, 45) =3.621, p = 0.06, *partial* η^2 = 0.074; LongLoR: F (1, 45) =35.356, p = 0.000, *partial* η^2 = 0.44). These results suggest that length of residence makes more of a difference in the acquisition of complex structures like the past tense when the level of education is high. Figure 7-7 below provides a visual representation of performance on the past tense of existing verbs between the two groups.

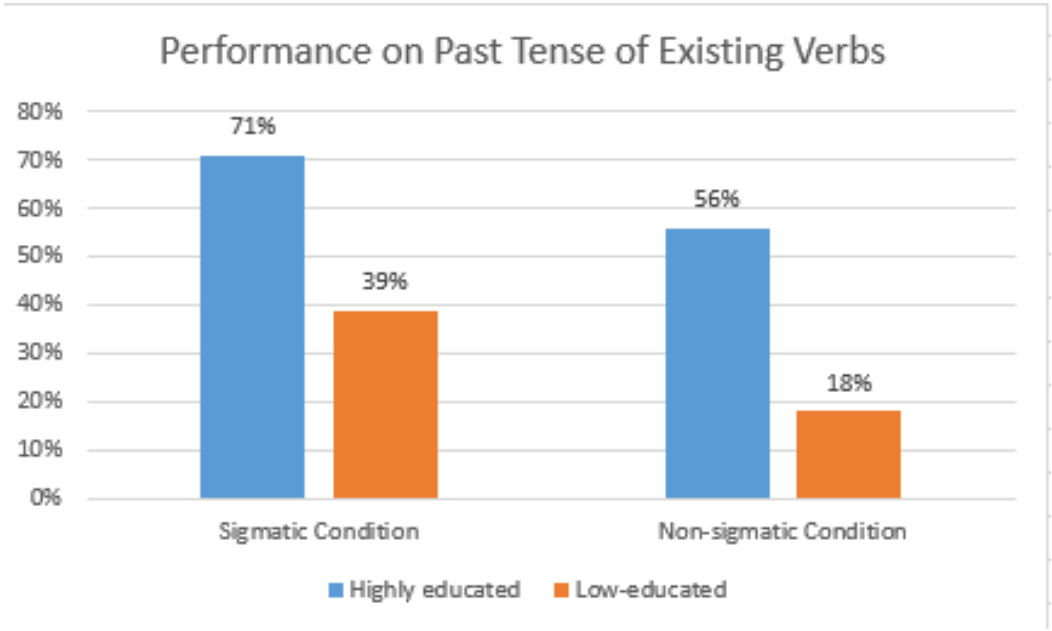

Figure 7-7: Performance of the two groups on the past tense of existing verbs

For non-existing past verbs, the difference in the mean percentages between the two groups is the largest of all structures (LowEd: ShortLoR *M=5%,* LongLoR *M=5%*; HighEd: ShortLoR *M=50%,* LongLoR *M=40%*). A 2 (group) x 2 (LoR) ANOVA revealed a main effect of group with a large effect size (F (1, 45) =17.592, p = 0.000, *partial* η^2 = 0.281) but no main effect of LoR (F (1, 45) =0.279, p = 0.6, *partial* η^2 = 0.006). There was an interaction effect for both groups (ShortLoR: F (1, 45) =6.020, p = 0.02, *partial* η^2 = 0.118; LongLoR: F (1, 45) =59.619, p = 0.000, *partial* η^2 = 0.57). Thus, with respect to applying a complex structure to non-existing items, it could be the case that the highly educated group had achieved this earlier than the low-educated group. Figure 7-8 below provides a visual representation of the two groups' performance on the past tense formation of the non-existing verbs.

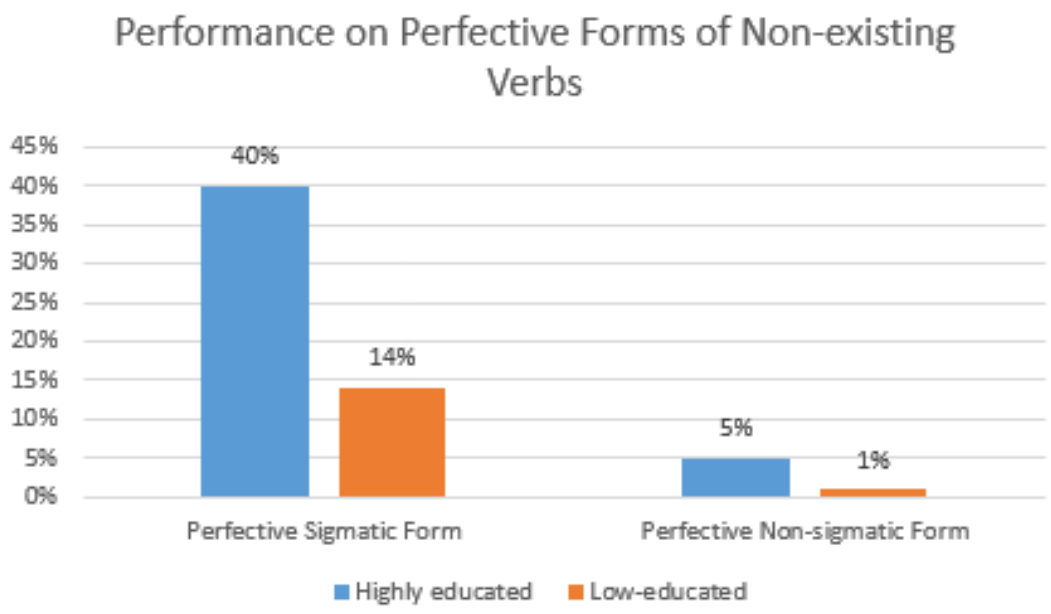

Figure 7-8: Performance of the two groups on the past tense of non-existing verbs

An error analysis on the novel verbs showed that the less educated learners preferred other ways to show that an event had taken place in the past. The low educated group applied the following forms in this order of preference: 'imperfective past tense', 'have and present tense', and 'production of existing sigmatic verb'. The 'imperfective past tense' form (equivalent of the Past Continuous) implies keeping the stem of the verb and attaching the past tense endings (e.g. *horé**v**o* 'I dance' becomes *hóre**v**a* 'I was dancing' instead of *hóre**ps**a* 'I danced'). Thus, the imperfective could be characterised as simpler and easier to form than the perfective due to the lack of phonological stem changes in the former. The 'have and present tense' form that my participants produced is ungrammatical (e.g. **ého pléno* 'I have wash'). What the learners did was to add the auxiliary 'have' (*ého*) followed by the present tense form that I produced (e.g. *hrokégi* became **éhi hrokégi*). Thus, they were unable to form the past participle of the novel verb in order to create the grammatical form of the Present Perfect (similar to Julien et al., 2016; Mocciaro, 2019; Vainikka et al., 2017).

On the surface then, the results seemed to show that the less-educated participants confused the perfective aspect with the perfect tense. 'Production of existing sigmatic verb' refers to cases where learners failed to produce the novel verb and produced instead an existing verb belonging to the sigmatic condition (e.g. *gkouthéni* became *éfekse* 'it dawned'). Table 7.8 shows the mean percentages (and standand deviations) of the error analysis with respect to the formation of the nonce verbs.

Table 7-8 Mean percentages (and standard deviations) for the error analysis of the nonce verbs of Experiment 2

		Error Analysis of Nonce Verbs		
		NonceImperf	*NonceHavePres*	*NonceExistSigm*
Group	*LoR*	*M (SD)*	*M (SD)*	*M (SD)*
LowEd	*ShortLoR*	*50 (0)*	*40 (0)*	*0 (0)*
	LongLoR	*45 (35)*	*20 (26)*	*15 (28)*
HighEd	*ShortLoR*	*10 (14)*	*0 (0)*	*0 (0)*
	LongLoR	*28 (23)*	*1 (4)*	*5 (11)*

Explanatory note: Nonce Imperf: nonce verbs in the imperfective past tense; NonceHavePres: nonce verbs in the ungrammatical form of 'have' & the present tense; NonceExistSigm: the replacement of the nonce verb with an existing verb in the sigmatic (regular) condition.

The imperfective form constituted the majority of erroneous responses with the less educated group providing most of the responses (LowEd: ShortLoR *M=50%,* LongLoR *M=45%*; HighEd: ShortLoR *M=10%,* LongLoR *M=28%*). A 2 (group) x 2 (LoR) ANOVA did not reveal any significant effect of group (F (1, 45) =2.360, p = 0.1, *partial* η^2 = 0.050) or LoR (F (1, 45) =0.123, p = 0.7, *partial* η^2 = 0.003). There was a significant interaction only for the learners with a shorter LoR (ShortLoR: F (1, 45) =4.042, p = 0.050, *partial* η^2 = 0.082; LongLoR: F (1, 45) =1.201, p = 0.3, *partial* η^2 = 0.026), meaning that the learners with a low education and with a shorter length of residence made the most errors by applying the imperfective form on the nonce verbs.

The 'have+present tense', which was ungrammatical, was the next preference for the less educated group for forming the nonce verbs erroneously *(LowEd: ShortLoR M=*40*%, LongLoR M=*20*%; HighEd: ShortLoR M=0%, LongLoR M=1%).* A 2 (group) x 2 (LoR) ANOVA revealed a

main effect of group with a large effect size (*F (1, 45) =5.924, p = 0.02, partial η^2 = 0.116*) but no main effect of LoR (*F (1, 45) =0.655, p = 0.4, partial η^2 = 0.014*). There was a significant interaction with a large effect size only for the learners with a shorter LoR (*ShortLoR: F (1, 45) =10.931, p = 0.00, partial η^2 = 0.195; LongLoR: F (1, 45) =2.913, p = 0.1, partial η^2 = 0.061*), indicating that only the low educated participants with limited amount of exposure to the L2 produced this ungrammatical form significantly.

Fewer erroneous responses consisted of replacing the nonce verb with an existing verb in the sigmatic condition (*LowEd: ShortLoR M=0%, LongLoR M=15%; HighEd: ShortLoR M=0%, LongLoR M=5%*). Interestingly, only those with a longer LoR were able to replace the nonce verbs with existing ones, suggesting that input had contributed in acquiring knowledge of these existing verbs as vocabulary. However, a 2 (group) x 2 (LoR) ANOVA did not reveal any significant main effects of group (*F (1, 45) =0.139, p = 0.07, partial η^2 = 0.003*) or LoR (*F (1, 45) =0.557, p = 0.5, partial η^2 = 0.012*), while there was no interaction between the two (*ShortLoR: F (1, 45) =2.538, p = 0.1, partial η^2 = 0.053; LongLoR: F (1, 45) =0.00, p = 1, partial η^2 = 0.00*). Figure 7-9 below provides a visual representation of the two groups' performance on the formation of the non-existing verbs with respect to resorting to forms other than the sigmatic or the non-sigmatic condition.

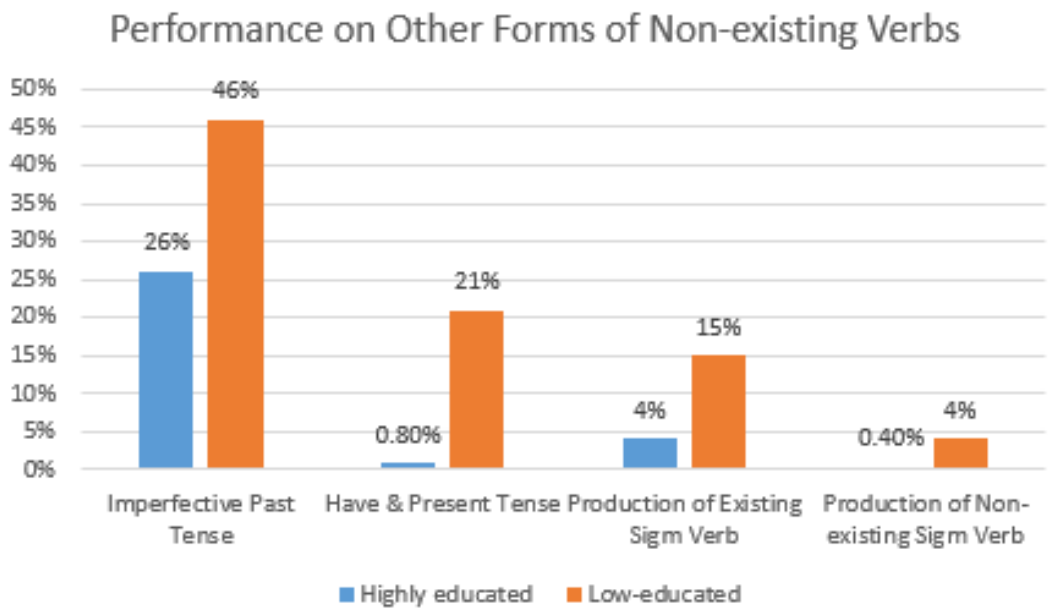

Figure 7-9: Performance of the two groups on other forms of non-existing verbs

Both groups produced incorrect forms, with the less educated learners producing the most erroneous responses. However, it is clear that the more educated group's preference in forming the novel verbs was the sigmatic condition, while the imperfective was its second choice. The less-educated learners resorted to the use of other forms, which they thought were correct and which turned out even simpler than the regular condition. This means that not even the more educated adult L2 learners generalised the non-sigmatic condition, which seems to indicate the importance of explicit instruction for those forms that are considered the most complex.

7.3.2 Proficiency Measures

Length of residence had a significant main effect on the two fluency measures, namely *speech rate* and *pauses to fluent segments*. Education had a main effect on TTR, which is an indication of how lexically diverse a

speech sample is. Table 7.9 shows the means (and standard deviations) of the proficiency measures for both groups.

Table 7-9 Mean percentages (and standard deviations) of the proficiency measures for Experiment 2

	Groups			
	LowEd		HighEd	
Proficiency measures	ShortLoR	HighLoR	ShortLoR	HighLoR
MLTU	8.24 (0.8)	8.29 (2)	8.14 (0.3)	9.67 (0.3)
Clausal Density	1.09 (0.1)	1.21 (0.2)	1 (0)	1.25 (0.2)
TTR (%)	60 (4)	72 (8)	83 (0)	81 (14)
Lexical Density	29 (3)	36 (6)	35 (0)	42 (7)
Speech Rate	49 (10)	56 (6)	56 (0)	62 (7)
Pauses to Fluent Segments (%)	50 (1)	56 (5)	53 (0)	56 (6)

MLTU and clausal density are measures of grammatical complexity in speech. For MLTU, the learners of the low educated group with shorter and longer LoR had similar scores (ShortLoR: *M=8.24;* LongLoR: *M=8.29*). In the more educated group, the learners with a longer LoR achieved a higher score (ShortLoR: *M=8.14;* LongLoR: *M=9.67*). A 2 (group) x 2 (LoR) ANOVA did not reveal a main effect of group (F (1, 43) =0.092, p = 0.76, *partial* η^2 = 0.002) or of LoR (F (1, 43) =0.139, p = 0.71, *partial* η^2 = 0.003), nor was there any interaction effect (ShortLoR: F (1, 43) =0.001, p = 0.98, *partial* η^2 = 0.000; LongLoR: F (1, 43) =1.846, p = 0.18, *partial* η^2 = 0.041). This means that neither education nor quantity of input had an effect on the mean length of T-units that the learners produced.

For clausal density, both groups had similar scores regardless of the input they received (LowEd: ShortLoR *M=1.09,* LongLoR *M=1.21*; HighEd: ShortLoR *M=1,* LongLoR *M=1.25*). A 2 (group) x 2 (LoR) ANOVA did not reveal a main effect of group (F (1, 43) =0.034, p = 0.86, *partial* η^2 = 0.001) or of LoR (F (1, 43) =2.286, p = 0.14, *partial* η^2 = 0.050), nor was there any interaction effect (ShortLoR: F (1, 43) =0.142, p = 0.71, *partial* η^2 = 0.003; LongLoR: F (1, 43) =0.582, p = 0.45, *partial* η^2 = 0.013). These results suggest that the ability to produce subordinate clauses does not necessarily transfer into the L2.

TTR and lexical density indicate lexical richness. For TTR, the more educated group achieved higher scores (LowEd: ShortLoR *M=60%,* LongLoR *M=72%*; HighEd: ShortLoR *M=83,* LongLoR *M=81*). A 2 (group) x 2 (LoR) ANOVA revealed a main effect of group with a large effect size (F (1, 43) =4.823, p = 0.03, *partial* η^2 = 0.101) but no main effect of LoR (F (1, 43) =0.534, p = 0.47, *partial* η^2 = 0.012). There was a significant interaction effect for the learners with a longer LoR (ShortLoR: F (1, 43) =2.692, p = 0.1, *partial* η^2 = 0.059; LongLoR: F (1, 43) =6.352, p = 0.02, *partial* η^2 = 0.129). In the more highly educated group, those with a shorter LoR scored slightly higher than those with a longer LoR. Something to look at in the future is how much of a difference access to Greek text and interaction with native speakers make.

For lexical density, in both groups, the learners with a longer LoR achieved higher scores (LowEd: ShortLoR *M=29%,* LongLoR *M=36%*; HighEd:

ShortLoR *M=35,* LongLoR *M=42*). A 2 (group) x 2 (LoR) ANOVA did not reveal a main effect of group (*F* (1, 43) =2.083, *p* = 0.2, *partial* η^2 = 0.046) or of LoR (*F* (1, 43) =2.881, *p* = 0.1, *partial* η^2 = 0.063). However, there was an interaction effect with a large effect size for those learners with a longer LoR (ShortLoR: *F* (1, 43) =0.561, *p* = 0.5, *partial* η^2 = 0.013; LongLoR: *F* (1, 43) =8.957, *p* = 0.005, *partial* η^2 = 0.172). The mean percentages suggest that, in the more educated group, length of residence contributed to the production of more content words (verbs, adjectives, nouns and adverbs).

Speech rate and pauses to fluent segments are measures of fluency. For speech rate, the more educated group achieved higher scores, especially those learners with a longer LoR (LowEd: ShortLoR *M=48%,* LongLoR *M=56%*; HighEd: ShortLoR *M=56,* LongLoR *M=62*). A 2 (group) x 2 (LoR) ANOVA did not reveal a main effect of group (*F* (1, 43) =1.477, *p* = 0.2, *partial* η^2 = 0.033). However, there was a main effect of LoR (1, 43) =4.233, *p* = 0.04, *partial* η^2 = 0.090) and a significant interaction with a moderate effect size for those learners with a longer LoR (ShortLoR: *F* (1, 43) =1.729, *p* = 0.2, *partial* η^2 = 0.039; LongLoR: *F* (1, 43) =3.167, *p* = 0.04, *partial* η^2 = 0.061). In other words, quantity of input contributed to the production of more words per minute especially in the more educated group.

For pauses to fluent segments, the more educated group scored slightly higher, although the learners with a longer LoR in both groups had the same score (LowEd: ShortLoR *M=50%,* LongLoR *M=56%*; HighEd: ShortLoR *M=53,* LongLoR *M=56*). A 2 (group) x 2 (LoR) ANOVA did not reveal a main

effect of group (F (1, 43) =0.201, p = 0.7, *partial* η^2 = 0.005). However, there was a main effect of LoR with a moderate effect size (F (1, 43) =2.139, p = 0.04, *partial* η^2 = 0.071), and an interaction effect for long LoR with a large effect size (ShortLoR: F (1, 43) =0.975, p = 0.3, *partial* η^2 = 0.022; LongLoR: F (1, 43) =4.561, p = 0.04, *partial* η^2 = 0.096). This suggests that length of residence, not education, contributes to the development of fluency, while learners with a longer LoR from both groups had the same scores.

7.4 Discussion

In this experiment, I examined language acquisition by adult naturalistic learners of Greek as an L2, focusing specifically on the role of education and length of residence (input). Some researchers (e.g. Flege 2009) have proposed that the differences in outcome between L1 and L2 acquisition depend largely on the quality and quantity of the input. However, other researchers (e.g. Birdsong 2006; Birdsong and Molis 2001; DeKeyser et al. 2010; Johnson and Newport 1989) argue that the effects of input are overshadowed by age of acquisition effects. Therefore, the failure of (most) adult L2 learners to acquire native-like competence is best explained by postulating a critical period for language.

I anticipated that both factors would contribute to L2 attainment, but in different ways. I hypothesized that higher educational attainment would be most relevant to the acquisition of “decorative” morphology (grammatical markers whose contribution to meaning is largely redundant), particularly

those aspects which are relatively complex and/or irregular. On the other hand, input would facilitate fluency.

This prediction was largely confirmed: there was a relationship between language tasks and L1 education, with more educated participants achieving higher scores, rather than length of residence. Moreover, the results show a clear pattern. The effects of education are most noticeable on the most difficult grammatical tasks, i.e., past tense, especially the past tense of existing non-sigmatic (i.e., irregular) verbs, and novel verbs. This supports Tarone et al.'s (2009) findings, where level of literacy was related to performance in morphosyntax. Tarone et al.'s (2009) low-literacy group used quantifiers (lexical morphemes that express plurality) instead of the plural ending *–s*, while they produced verbs that lacked inflections half of the time. Less literate learners also failed to produce subordinate clauses with *so* and *because*. There was no significant effect of education on singular determiner agreement or singular adjective agreement in the current experiment. This, however, was most likely due to ceiling effects, as performance on these measures was 91% and 87% correct respectively.

Consequently, my findings have theoretical implications for Schmidt's (2001) *Noticing hypothesis*, which was also tested by Tarone et al. (2009). In his personal language learning experience, Schmidt pointed out the fact that, during his interactions with native speakers of the L2, he noticed those features which were taught in the classroom. Formal instruction raised his awareness of the target forms and contributed to him paying attention to

them. However, exposure also played a role, as structures that did not appear in the native speakers' input never appeared in the learner's output. Thus, instruction on its own contributed to noticing the grammatical features but was not enough for their oral production. Input combined with explicit instruction increased the chances for these structures to appear in the learner's output.

On the contrary, half of the verbs that Altman (1990) produced, who was also exposed to Portuguese through instruction and interaction, were not taught in the classroom. Highly educated L2 learners like Schmidt and Altman benefit both from instruction, which draws their attention to form explicitly, and input, which helps to internalise language implicitly. Jourdenais et al. (1995), who tested the effects of textual enhancement on the noticing of the Spanish past tense forms, found that the learners' awareness of aspect decision grew after they were exposed to this type of input. Although Loewen and Inceoglu (2016) did not produce the same finding, i.e. textual enhancement was not related to greater levels of target structure awareness, they still pointed out the importance of input flood. All of their learners improved in the target features regardless of the type of input enhancement they received. Even though findings regarding the application of textual enhancement are mixed, the combination of instruction and any type of input contributes to growth of awareness and noticing of grammatical forms.

The fact that my learners did not produce all of the correct grammatical morphemes, especially in the more complex structures where their

performance dropped dramatically, also supports Ellis' (2017) theory on selective attention. Ellis argued that learners need to be selective about the attention they pay to language due to cognitive load. Thus, to reduce cognitive load, they end up paying more attention to certain structures than others, which is defined by the salience, or strength, of a stimulus. Inflectional morphemes, which are among the most frequent linguistic features, are also among the least salient ones. High frequency combined with the fact that inflectional morphemes cannot stand on their own without attaching to a lexical morpheme lead to such phonological entrenchment, which does not allow the L2 learner to notice them. The result is the production of a simpler language, either by neglecting to produce them or by resorting to the creation of a simpler yet close enough form, which serves its purpose.

In the current experiment, fluency (speech rate and pauses to fluent segments) was predicted by length of residence (input) but not by education. This is most likely the case because it depends (almost) entirely on implicit learning, which is not associated with education. The acquisition of "decorative" grammar has a strong explicit component, at least in adult learners (see Agathopoulou et al. 2008). Both lexical measures, TTR and lexical density, were related to education, indicating that more educated participants have larger vocabularies in the L2, possibly as a result of developing better strategies for learning new words. There were no significant main effects or interaction for the measures of grammatical complexity, MLTU and clausal density. This is surprising, especially for

clausal density, because it is well established that in literate speakers (school children), clausal density increases steadily throughout childhood and adolescence (Frizelle et al. 2018; Nippold et al. 2005; Scott 1988). This increase is most likely attributable to exposure to written texts (Dąbrowska in press). I should note that the clausal density in my sample (mean 1.22 and median 1.19) is quite low. I have no data on the development of clausal density in children acquiring Greek as a first language. However, literate English-speaking children usually attain this level (M=1.22) at about the age of nine, that is to say, after three or four years of schooling. Assuming that the figures are similar for Greek, my results suggest that the ability to produce subordinate clauses does not necessarily transfer into the L2 — although clearly further research is necessary to establish this conclusively.

Inflectional morphemes such as agreement and past tense markers, which are largely redundant from a semantic point of view, are known to be difficult for L2 learners, and are among the structures that are most likely to fossilize (Han 2013). However, as noted earlier, according to the Missing Surface Inflection Hypothesis (MSIH), the learner's failure of realising the overt inflectional morphology on the surface does not necessarily mean that the L2 learner has not acquired the verbal morphology (Haznedar, 2001; Haznedar, 2003; Haznedar and Schwartz, 1997; Lardiere, 1998a, b, 2000; Prévost and White, 2000a, b). It might be a case of failing to mark overt morphology but using other means to mark tense, person and mood, such as auxiliaries. This might be an inter-developmental stage that L2 learners go through before they manage to produce overt inflections. MSIH seems to explain why my

less-educated participants tended to produce the ungrammatical form of ‘have’ followed by the present tense of the target verb, instead of the inflected version. The use of the auxiliary shows that they realised that there was need for the past tense but that they still were not at the stage where they could apply this internally on the verb through inflections.

There was considerable variation in performance on all tasks: for example, for existing past non-sigmatic verbs, individual scores ranged from 0% to 90% correct, and for plural determiner and adjective agreement, from 44% to 100%. However, these results showed a clear difference between agreement and tense marking in this respect. Agreement marking in Greek is comparatively simple. Children acquiring Greek as a first language typically master agreement morphology in the preschool years (Diamanti et al. 2018; Koromvokis and Kalaitzidis 2013). My learners also attained relatively high levels of performance, with means ranging from 78% correct on plural adjective agreement to 91% correct on singular determiner agreement, and a relatively high proportion of participants performing at ceiling. In fact, for each of the four agreement measures, more than half of the participants with nine or more years of L1 schooling achieved a perfect score. In the less educated group, the number of participants performing at ceiling was lower, ranging from 21% on the most difficult task, adjective plural agreement, to 58% on singular determiners.

However, it is also evident that the L2 learners found number agreement more challenging than singular agreement. To my knowledge, only two

studies have looked at number agreement in L2 Greek, namely Agathopoulou et al. (2008) and Andreou et al. (2008)[23]. Agathopoulou et al. (2008) studied adult L2 learners of Greek who had received instruction for the target structure and were living in Greece for less than one year at the time of the study. Findings showed that agreement in adult L2 learners is mastered gradually, while it benefits from instruction that includes typographical enhancement of the inflectional morphemes. Andreou et al. (2008) also found that their English native speakers, who had attended school for their last four years and were residing in Greece at the time of the study, struggled with inflectional morphology. The more proficient learners had the highest performance, while all learners were faster and made fewer errors in the word order task. In the current experiment, only education had an effect on number agreement, supporting the argument that "decorative" morphology is influenced by explicit instruction.

Pica (1983) also found that her participants had trouble producing the plural *–s* endings in L2 English and preferred instead the use of quantifiers, such as *three* and *a lot of*. This probably happened because the L2 learners were able to express plurality through these lexical morphemes, which are more salient in speech than inflectional morphemes (similar to Tarone et al. 2009). Thus, the L2 learners preferred the use of more salient elements of speech when these are available and meet the requirements to convey the necessary meaning. In this case, the learners automatically knew not to pay any attention to the low salient cues, which are the grammatical morphemes

[23] Discussed in sections 4.3.3 and 4.3.4 respectively.

(Ellis 2017). Even though the results of the current experiment indicate that it is possible even for low-educated naturalistic adult learners to attain native-like levels of performance in this area, it is also evident that the more complex a structure is, the more differences occur in performance based on level of education. There were no differences between the two groups in singular agreement. However, there was a significant difference in plural adjective agreement, indicating that applying agreement in the plural number between the adjective and the noun is more challenging than singular agreement or than agreement between the determiner and the noun.

Since I used the same test as Stavrakaki and Clahsen (2009) and Clahsen et al. (2010), I can directly compare my results with theirs. Perhaps the most striking finding from my study is the extent of individual differences in attainment in my group of long-resident L2 learners. My participants' responses of the past sigmatic form ranged from 10% to 90%, while the mean of correct responses was 55%. Even the youngest L1 learners tested by Stavrakaki and Clahsen (2009), who were aged between 3 and 4, performed better than my participants on existing sigmatic verbs (M=70%). Performance in the existing non-sigmatic condition was similar, while the L1 children performed better than my participants in the non-rhyming novel verbs by 16%.

However, the picture changes when my participants are divided into two groups. The more educated group performed similarly to the children aged between 3 and 4 in the existing sigmatic and the non-rhyming novel verbs,

as opposed to the existing non-sigmatic condition, where the more educated group scored higher than the child group by 20%. Thus, education led to more accurate responses in the irregular condition. On the other hand, the less educated group performed substantially poorer than the youngest child group in all conditions.

Clahsen et al. (2010) used the same test with highly educated instructed learners with a much shorter length of residence (from 2.3 to 6.8 years). This group did much better than my participants, achieving scores of 90% on existing sigmatic verbs, 66% on existing non-sigmatic verbs, and 76% on non-rhyming novel verbs. Therefore, the differences between the current experiment and those of Clahsen and colleagues show that instruction contributes to increased attention to form, while low-educated L2 learners can perform even lower than child native speakers.

It is worth referring to one of the main differences between my study and the two past studies of Clahsen and colleagues. In both past studies, the most common responses for all groups was the sigmatic past tense form, while the highest performance was noted in the sigmatic condition of the existing verbs. The latter was also true for my participants. However, only the more educated group generalised the sigmatic condition in the non-rhyming novel verbs, while the imperfective was the low-educated group's most preferred way of forming the past tense of the non-rhyming novel verbs. In Clahsen et al. (2010), there were times when the learners replied with imperfective past tense forms, especially in non-sigmatic verbs (*n*=82). Other responses

included perfective past tense forms of verbs different than the target ones (e.g. *érapse* ‘sew’ instead of *kóntine* ‘shortened’), and incorrect stems of a sigmatic (e.g. **trípikse* instead of *trípise* ‘bore’) or a non-sigmatic verb (e.g. **kóntane* instead of *kóntine* ‘shortened’) (Clahsen et al. 2010: 510). These ‘other’ responses were still too complex for my sample, with the exception of the imperfective. My participants’ ‘other’ responses included an ungrammatical, yet simpler, version of the Present Perfect, while they failed to produce novel verbs almost 20% of the time.

It should be stressed, however, that while there was evidence of fossilisation in some areas, other aspects of language continued to develop for a long time after arrival. This is most noticeable on measures of fluency and clausal density, but as already seen, length of residence was also positively correlated with performance on determiner plural agreement, particularly in the less-educated participants. This supports Han's (2013) claim that fossilisation is highly selective, both at the level of individual structures and the individual learner.

7.5 Conclusion

My experiment looked at the role of L1 literacy in L2 attainment and the role of input on the level of proficiency by studying a group of L1 Albanian speakers who differed considerably in the amount of schooling they had had in their L1, and who learned L2 Greek as adults in naturalistic contexts. The gap between those learners who had received a high education in their L1

and those who had not became larger and clearer when they were tested in more challenging structures.

Chapter 8 – General Discussion and Conclusions

8.1 Introduction

In this chapter, I present the summary of the findings outlined in the current thesis and discuss how the current research contributes to professional discussion in the field of SLA. Importantly, through this thesis, I was able to address the existing research gap identified in Chapter 1 by answering two main RQs. These questions were: 1) Does the presence of alphabetic print facilitate attention to form?, and 2) Can naturalistic adult learners with different levels of education acquire less salient aspects of the L2 without explicit instruction drawing their attention to form?

I specifically drew attention to the existing research gap regarding the influence of alphabetic print literacy on the production of oral skills. This research gap - investigating the acquisition of the L2 oral skills by learners with a low level of education in the L1 - was recently pointed out by Tarone et al. (2009). The researchers tested Schmidt's *Noticing hypothesis* by looking at the acquisition of morphosyntax by low literate Somali L2 learners of English. Overall, their findings showed that the less literate learners produced uninflected nouns and verbs, while they also tended to use less complex language than their more literate counterparts by avoiding the production of subordinators in clauses of cause and effect. These differences in performance imply that, less literate learners who are not exposed to any

writing are less likely than more literates to notice those aspects of language to which attention needs to be drawn through explicit instruction.

Excluding the work of Tarone et al., broadly, there has not been a great number of studies focusing on the acquisition of L2 morphosyntax by the target population. One exception is van de Craats and van Hout (2010), who looked at the interference of the L1 in the interlanguage of Moroccan learners of Dutch. The researchers found that the overgeneralisation of the thematic verb *ga(at)* 'to go' in Dutch, instead of the use of the auxiliary *is*, was due to the influence of one of the auxiliaries (*gadi*) in the L1 (see Chapter 2, section 2.4.4). Their learners were very low educated in the L1. The majority of the studies looking at L2 oral production have focused mainly on the phonological processing of learners with differing levels of literacy in the L1 or on the acquisition of the cognitive skills of reading and writing before and after receiving instruction (e.g. see Kurvers 2002; Young-Scholten and Naeb 2010; Young-Scholten and Strom 2006). Therefore, the need to investigate L2 morphosyntax by the low educated population was imperative.

In two of the chapters that followed (Chapters 5 and 7), I reported the results of the two experiments, which were designed to answer the following RQs:

1. Does the presence of alphabetic print facilitate attention to form? If so:
    a. Does this contribute to a more accurate production of inflectional morphology in the L2?
    b. Does print facilitate generalisation of L2 morphology?

c. Does print contribute to the acquisition of L2 morphology over time?

2. Can naturalistic adult learners with different levels of education acquire less salient aspects of the L2 without explicit instruction drawing their attention to form?
    a. If so, are they able to produce accurate output?
    b. If not, do they produce less complex language than their highly educated counterparts?

In showing how I answered the RQs, I reveal how my research has contributed to the field of SLA by discussing the theoretical, methodological and pedagogical implications of the current findings. Finally, I discuss the limitations of my research and how the questions that emerged outline directions for future research.

8.2 Summary of Current Findings

8.2.1 Research Hypotheses

The current research investigated the influence of alphabetic print literacy to the production of oral skills in response to the 'research gap' identified by Tarone et al. This broad research gap was narrowed down to a specific examination on the acquisition of L2 Greek morphology, especially by naturalistic adult learners of Greek with a low educational background.

The aforementioned RQs tested two key theories, namely Schmidt's (2001) *Noticing hypothesis* and Ellis' (2017) *selective attention* theory. To answer RQs 1, 1a, 1b and 1c, I designed Experiment 1 with the software

OpenSesame. During this experiment, native speakers of English were exposed to textual and non-textual conditions (see Chapter 5). The aim of Experiment 1 was to identify whether alphabetic print would influence the accuracy of the learners' L2 oral production. I hypothesised that alphabetic print would contribute to paying more attention to form and generalising the trained condition. I also hypothesised that performance would drop in the delayed post-test but that the performance of the group that was not exposed to alphabetic print would have a larger gap between the two post-tests.

To answer RQs 2, 2a and 2b, I designed Experiment 2, which looked at the influence of the educational level of the L1 in the oral production of three morphological structures, namely singular agreement, plural agreement, and perfective past (see Chapter 7). I also measured the learners' proficiency level using a spontaneous speech task. I tested immersed native speakers of Albanian, who differed in their level of education in the L1 and in years of residence in the host country. I hypothesised that, level of education would facilitate attention to form, while fluency would be linked to quantity of input through length of residence in the host country. I also hypothesised that, differences in educational level, and thus noticing of grammatical form, would be more pronounced in the most complex grammatical structures.

8.2.2 Experiment 1

The L2 learners were tested through both comprehension and production tasks, analysing vocabulary and grammar acquisition. All learners performed at ceiling in the comprehension tasks (above 98%), while results for

vocabulary production showed similar acquisition from both the text and the audio group (average performance varied from 66% to 77%). This means that, comprehension was much easier than speech production, while vocabulary production was easier than grammar production. However, scores in grammar production were extremely low, showing that the learners failed to produce accurate oral responses of grammatical morphemes. This possibly suggests that, the learning of morphemes requires more time and more exposure to input. Average scores varied from as low as 7% to 18% in determiner agreement and from 9% to 22% in adjective agreement. Overall, this difference in performance between vocabulary and grammar shows the difficulties that learners faced in the acquisition of L2 morphosyntax (see Duncan et al. 2009; Karanth et al. 1995; Nunes et al. 2009).

It is also worth noting the differences in performance based on type of task and teaching. The learners scored a lot lower in their oral production than they did in their comprehension of the target structures. This may mean, oral production requires exposure to a larger amount of input than comprehension does, and/or implicit teaching of grammar does not draw the learner's attention to form. Thus, it seems that print alone was not enough for acquisition in grammar to take place with such low amounts of input, while implicit teaching turned out more successful for vocabulary acquisition.

Furthermore, my prediction that the learners' performance would drop at the delayed post-test was partly supported by the findings. The effect of time was significant only in vocabulary and adjective agreement. Performance in

vocabulary, where scores dropped from the immediate to the delayed post-test, supported my prediction. In adjective agreement, although the text group improved at the delayed post-test, it did not generalise the trained condition. This means that text did not play a role in the generalisation of the trained items. The audio group, however, generalised the trained condition at the delayed post-test even to a small extent. This unexpected finding did not support my predictions that, print would contribute to the generalisation of the trained condition, nor did the learners' performance drop at the delayed post-test. Thus, it could be the case that print hindered learning. Overall, findings regarding grammar production were mixed and somewhat unexpected, which indicates a need for future research. It is important that participants are tested over a greater period of time. It is possible that more time is required between the immediate and the delayed post-test in order to see the long-term learning effects of experimental treatments (Rosa and Leow 2004).

Answers to the exit questionnaire revealed a different pattern to the oral production task. The text group demonstrated a higher level of metalinguistic awareness by providing responses of a more form-focused nature, while all learners noticed the differences between the forms. This was not the case for the audio group where, there were learners who did not notice the two colour adjectives, while the audio group's answers were not as elaborate as the answers of the text group. Thus, text contributed to increasing the level of metalinguistic awareness and, consequently, the ability to provide explicit explanations verbally comparative to just audio exposure (see Castro-Caldas et al. 1998; Kurvers 2002; Reis and Castro-Caldas 1997). This indicates that,

noticing did take place in this group. However, the learners' failure to turn input into oral language, since both groups had very low scores in their oral production of grammar, is an indication that being able to express noticing through metalinguistic terms does not guarantee accuracy in oral production. Therefore, oral production of inflectional morphemes turned out more challenging than comprehension, production of vocabulary, or even verbal report of metalinguistic awareness.

8.2.3 Experiment 2

Experiment 2 explored the influence of the educational level of the L1 in the oral production of the three morphological structures, while also measuring the learners' proficiency level through a spontaneous speech task. I tested the learners' performance in singular and number agreement, and past tense marking through three language tasks, one for each structure.

My results confirmed that there was indeed a relationship between language tasks and education in that participants that were more educated achieved higher scores than those with a lower level of education. Fluency was found to be linked to input through length of residence, which also supported my prediction. This was not surprising, as fluency depends on implicit learning. The effects of L1 education were more noticeable on the most difficult grammatical task, i.e. past tense, which is found more in writing (Dąbrowska in press). The findings supported my prediction that the more complex the grammatical structure is, the larger the effect of education on that structure will be.

All learners of Experiment 2 achieved very high scores in the oral production of singular agreement. L1 Greek children are known to acquire singular agreement in the preschool years (Diamanti et al. 2018; Koromvokis and Kalaitzidis 2013), while advanced L2 Greek adolescents aged 12-14 years old perform at ceiling in gender assignment (Konta 2012a). DeKeyser (2005) argues that, grammatical agreement and verbal aspect are among the most challenging linguistic structures for L2 learners whose L1 either does not have these structures or uses a different system. This would explain why the Turkish adolescent learners in Konta's (2012a) study scored lower in agreement than the Albanian adult learners of Experiment 2 despite that the latter, did not receive any instruction in the L2. Note, Turkish is a language without grammatical gender, while Albanian has a two-gender system, similar in complexity to that of Greek. It is likely that my Experiment 2 learners acquired the grammatical gender because it is more likely for the latter to be encountered in speaking than the past tense. Therefore, high levels of immersion in the everyday life of the host country for many years increase the chances of acquiring those features encountered in spoken language. DeKeyser (2005) also points out the challenges of acquiring morphology when the learner is a beginner with a low amount of input exposure. Despite their low education in the L1, the immersed L2 learners performed at ceiling in singular agreement. Thus, quantity of input contributed to increased accuracy in this relatively simple morphological feature.

With respect to past tense formation, my learners scored slightly above chance in the sigmatic condition (*M*=55%), and much lower in the non-sigmatic and the novel verbs (*M*=38% and *M*=23% respectively). These scores are much lower than the lowest score in agreement (*M*=78% in number adjective agreement), which shows how much more difficult it becomes to acquire inflectional morphology of the most complex structures. This is different to the L1 children of Stavrakaki and Clahsen's (2009) study. L1 children scored from an average of 70% for the youngest group to almost at ceiling (*M*=99%) for the oldest child group (8-9-year-olds) in the sigmatic condition. Interestingly, the difference in performance between the sigmatic and non-sigmatic conditions was more pronounced in the youngest child groups. Scores for L1 children were also higher in the non-rhyming novel verbs. They started from an average of 39% for the youngest group to 81% for the oldest child group. Thus, my naturalistic learners scored lower than the youngest group in Stavrakaki and Clahsen in all aspects.

Clahsen et al.'s (2010) L2 learners had a similarly high performance in the sigmatic condition, with the intermediate learners scoring an average of 88% and the advanced learners an average of 94%. Performance dropped slightly above chance in the non-sigmatic condition for the intermediate learners (*M*=57%) and to 78% for the advanced learners, while scores were not too different for the non-rhyming novel verbs (L2 intermediate: 74%; L2 advanced: 78%). Thus, my naturalistic learners scored lower than the highly educated, instructed learners of Clahsen et al. in both conditions, indicating

that instruction played a significant role in the acquisition of this complex L2 structure.

With respect to the non-rhyming novel verbs, the instructed learners of Clahsen et al. and the higher-educated learners of my experiment showed a preference for generalising the regular condition on items that carried no meaning. However, it seems that even the regular condition was too complex for my low-educated learners, who did not apply it in order to form the past tense of the novel items. Despite their regularity, Greek verbs still undergo internal, yet phonologically predictable, stem changes. However, these changes might be predictable for those learners who have received instruction in the L2, while they might seem arbitrary to naturalistic learners. This argument is supported by the results of the error analysis of Experiment 2, where the less-educated group's first preference in forming the past tense of the novel verbs was the imperfective past tense. In other words, it is a simpler way to show the past aspect without applying any internal stem changes to the verb. Therefore, my less-educated, naturalistic learners preferred a more simplistic approach in forming the most complex target structure of this experiment. This finding seems to support Tarone et al.'s (2009) findings, where their less-literate Somali learners of English produced language simpler than their more literate counterparts. Finally, it also answers my RQ in that those learners who have not noticed the form of less salient cues due to a low level of education produce less complex language by resorting to strategies that help them to cope with some of the most complex grammatical structures.

The fact that the youngest child group had higher scores in some cases shows the importance of exposure to the language through native speaker input. Native speaker input made more of a difference in the acquisition of this complex structure for L1 children, who had been exposed to Greek in the first 4 years of their life, than for low educated L2 learners who learned the L2 without any instruction and who had a low education in the L1. Put simply, naturalistic input does not suffice for the acquisition of complex structures like the past tense.

8.3 Contribution to Professional Discussion

The results of the current research have important theoretical, methodological, and pedagogical implications for the language sciences. Therefore, they should be of interest to linguists, academics, and practitioners in the fields of education – particularly those concerned with issues of language and literacy acquisition.

8.3.1 Theoretical Implications

A potential impact of L1 alphabetic print literacy in L2 acquisition is the learning of more complex aspects of language, which are in turn facilitated by noticing. Schmidt's hypothesis that L2 learners need to notice the differences between the input they receive and their own speech implies that low literate learners, who are not equipped with the necessary analytical skills, might be unable to acquire the L2. Or, it might be the case that the noticing hypothesis is applicable only to complex structures, such as subordinate clauses and inflectional morphology. That is because complex

structures are encountered more in writing than they do in speaking, while the written form is necessary because it draws attention to the less salient features of language. Therefore, it is more challenging for the target population to notice these structures, since the former's attention is not facilitated by exposure to writing. The main source of the low-educated L2 learners is primarily input that originates from aural sources.

As discussed, the results of Experiment 2 support Tarone et al.'s (2009) findings. My low educated L2 learners produced language simpler than their more educated counterparts did in that the former failed to produce the regular condition half of the time and also resorted to the use of simpler past tense forms. Thus, writing supports the use of a more complex language and the noticing of semantically redundant verbal morphemes, such as the third person singular inflection *–s* and the past tense ending *–ed*. This is because, a more literate learner will have been exposed to more writing, which is where there are more chances to encounter these structures.

Since complex language is encountered more in writing than in speaking, level of literacy might play a crucial role in their acquisition. L2 learners are usually taught complex linguistic features at an advanced level, meaning that their metalinguistic skills are also at a high level. Thus, as demonstrated in this study and Tarone et al.'s study, advanced L2 learners have more chances of being equipped with the necessary tools to notice and internalise input. In other words, noticing in the sense of attention to form might only concern the literate population.

Low literate adults might acquire the simpler structures unconsciously through interaction. After becoming literate, metalinguistic skills do not allow for unconscious noticing to take place. Therefore, illiterates might never be able to master those structures encountered in writing or they might acquire a simpler form of those structures, such as question formation without subject-verb inversion. Thus, the above imply that there is another set of simpler linguistic structures encountered in oral language, which can be acquired without any conscious noticing. This may explain why low literate learners are still able to become fluent in the L2. To acquire morphology, the learner needs to learn both the forms and the meanings of morphemes (Schmidt 2001). However, as it is more unlikely for learners to notice forms that are semantically redundant, like morphemes, different types of instruction need to draw explicit attention to these forms. In other words, deliberate attention to low-salient cues is a necessity in L2 input.

My learners' performance seems to align with Ellis' (2017) theory. The learners of Experiment 1 who were taught agreement implicitly, did not manage to produce the grammatical morphemes required for the accurate oral production of the L2. This contrasts with the naturalistic learners of Experiment 2, who had a low performance specifically in past tense formation often encountered more in writing. In other words, lack of explicit attention to form and lower levels of alphabetic print literacy skills did not allow for complete acquisition of the target grammatical morphemes.

8.3.2 Methodological Implications

The majority of learners investigated until the early 2000s originate from the middle-class, educated population and are usually recruited in university settings. This implies that, research findings from studying these highly educated speakers apply to any group of speakers. However, this belief is now questioned. Researchers are now examining educated-related differences that have occurred in L2 acquisition by studying the less educated population (e.g. see Tarone et al. 2009; van de Craats and van Hout 2010). Thus, Experiment 2 undertaken here is a response to this general belief by testing the less educated learners and generating similar findings.

The research design of Experiment 2 also revealed lack of materials that measure the oral proficiency of low educated learners of Greek. The Greek proficiency test used by Konta (2012), which was part of the test *Let's Speak Greek III* (Tzevelekou et al. 2003), could not be used for this experiment because it was in writing. Thus, the Greek government could consider creating a proficiency test especially for those learners who cannot rely on their writing skills in order to be assessed orally.

8.3.3 Social and Pedagogical Implications

Research on the influence of alphabetic print literacy and education-related differences on L2 oral skills also has some important pedagogical implications. Evidence indicates that low educated learners lag behind their more educated peers. Consequently, these low educated learners will need

more support in their language learning than others. Language teachers could dedicate more time to those learners who lack the basic skills and resources to learn the L2 (see Kurvers 2007, Kurvers and van der Zouw 1990).

Furthermore, more effort is needed in promoting literacy in the L2. Even though immigrants manage to integrate into the society of the host country, they do not have access to resources that will allow them to become literate in the L2. At the same time, lack of access or lack of information about how to access public spaces of literacy might cause literacy levels to fall. Local authorities could make efforts to promote literacy in the L2 by informing these learners on what resources are available in their area and by engaging the learners to literacy activities through local events.

Practitioners could also consider the differing strengths and weaknesses of less educated learners (Tarone et al. 2009) by implementing teaching methodologies catered to their needs. However, many practitioners lack professional expertise to teach this population, as teaching adults with more mature cognitive abilities than children to become literate can be both challenging due to lack of basic skills and rewarding due to the enhanced abilities that come with language experience. The project 'European Speakers of Other Languages: Teaching Adult Immigrants and Training their Teachers' (Naeb and Young-Scholten 2017) has been running from 2010 with the aim of providing online training to the teachers of low educated immigrants. Thus, an additional contribution of the current research focusing

on the low literate population is to inform teacher-training courses such as the aforementioned on the strengths and weaknesses of these L2 learners, and on how to build lessons around them (Tarone and Bigelow 2005). Providing a general picture of the target population's strengths and weaknesses would allow teachers to identify these in their own learners and use them to inform their teaching. Finally, it might be equally important for teachers to equip their students with the appropriate tools for independent learning, so that learners continuously develop their literacy skills outside the classroom. Learner training should be one of the teacher's priorities given the limited availability and constant mobility of the target population.

8.4 Limitations and Future Directions

While several important and interesting findings have emerged from this research, there are still limitations and unanswered questions. Nonetheless, these unanswered questions will also set the foundation for future research.

The intervention experiment suggested that comprehension was easier than production, while vocabulary was acquired with less input than grammar. Additionally, learners might possess metalinguistic awareness even if they are not able to be accurate in their oral production of inflectional morphology. This shows that verbal report of metalinguistic awareness does not necessarily entail the ability to produce the noticed input orally. However, my sample (*n*=46) was relatively small, while my learners were exposed to the target input for a short amount of time. Future research could consider including a larger number of participants, as well as to expose the learners to

more input and allow more time for processing. That is, the delayed post-test could take place two weeks or more after the teaching of the target structures in order to see the long-term effects of alphabetic print on the oral production of morphology.

Furthermore, in the current research, I was not able to investigate the ways other factors, such as gender, trauma, and motivation, may have played an important role in the learners' performance. Thus, it would be of great interest for future studies to address these issues. In addition, the learners of Experiment 1 were taught agreement implicitly. However, it would be useful to add other conditions in the teaching of this structure, such as explicit teaching with and without textual enhancement. This is to look at the difference in performance when attention to "decorative" grammar is drawn explicitly with and without changing the characteristics of the text.

Moreover, although I set out to study the oral skills of illiterate L2 learners, it was very challenging to gain access to entirely illiterate populations. In my case, I looked for speakers of one of my L1s, Albanian, both because I could recruit participants and because our common L1 would contribute to better interpretation of the findings. Thus, there is still a need to investigate the L2 morphosyntax of illiterate adult learners, especially of those whose native language does not have any inflectional morphology. This would be to explore whether these learners managed to acquire this phenomenon without having the L1 as a facilitator. One solution would be to look for L2

learners who are employed in positions that hardly require any knowledge of the L2 and whose L1 is not characterised by inflectional morphology.

8.5 Concluding Remarks

It is imperative that research is formulated in a way that challenges the existing theories and methodologies, and finds solutions on the challenges that learners of all backgrounds face. The two experiments presented in this thesis produced interesting data for the practitioners and academics in the language sciences. In other words, the current research produced original data with respect to the production of L2 oral skills by low educated learners. It specifically supported Tarone et al.'s (2009) findings regarding the use of a language simpler that the one used by more educated learners, which had theoretical implications for the *Noticing hypothesis* and the *selective attention* theory.

At the same time, the current research contributed to the field of SLA by investigating the acquisition of the oral skills of Greek, a language understudied yet with rich inflectional morphology. In addition, by finding out how low educated learners of Greek perform in the target features, the need to study the same features by speakers of languages with poorer morphologies and whose levels of education are even lower was also born. Finally, the current research presents the opportunity to conduct future studies, which should also produce equally interesting data and with similar implications.

Appendices

Appendix A – Task Battery (Morais et al. 1986)

Table A1. Task battery to assess the specificity of the effect of literacy training on speech segmentation (adapted, Morais et al. 1986)

Task	**Description**	**Example (where applicable)**
Segmentation of speech	To delete initial segment of pseudo-word: [p]+vowel, [l], [r], vowel [ʌ]+CV syllable/[ʃ]/[r]	e.g. [pùb(ə)], [plùku], [pràl(ə)], [ʌrdím(ə)]
Segmentation of melodies	To reproduce last three notes of a four-note melody	
Progressive segmentation of speech	Subject repeats part of experimenter's utterance, from phrase to single word to syllable to phoneme	
Detection of target sounds in auditorily presented speech	To listen to recorded sentences and isolate a sound previously mentioned by experimenter. Targets: [tà], [r], [tʌ], [k]	
Rhyme detection	Experimenter pronounces names of five pictures, one	

	being the target. Some objects' names rhymed. The subject has to show which had the same sound with the target	
Recall of pictures with rhyming and non-rhyming names	Series of pictures with rhyming and non-rhyming names were presented. Subjects had to recall order of presentation and rhyming or non-rhyming feature	e.g. *janela* 'window' – *capela* 'chapel' – *vitela* 'veal'

Appendix B – Training Items – Experiment 1

Table B1. Training Items - Task 1 - Experiment 1

Masculine		**Feminine**	
Article	**Noun**	**Article**	**Noun**
o	kádh-**os**	i	aposqev-**í**
the	bin	the	suitcase
o	tíh-**os**	i	thíq-**i**
the	wall	the	case
o	stóh-**os**	i	mihan-**í**
the	target	the	motorcycle
o	dhísk-**os**	i	klost-**í**
the	tray	the	thread
o	niptír-**as**	i	bloúz-**a**
the	sink	the	blouse
o	anaptír-**as**	i	ghóm-**a**
the	lighter	the	eraser
o	élik-**as**	i	bál-**a**
the	propeller	the	ball
o	hárak-**as**	i	karékl-**a**
the	ruler	the	chair

Appendix C – Testing Items – Experiment 1

Table C1. Testing items - Task 2 - Experiment 1

Masculine			**Feminine**		
Article	**Adjective**	**Noun**	**Article**	**Adjective**	**Noun**
o	kóqin-**os**	stóh-**os**	i	mávr-**i**	thíq-**i**
the	black	target	the	red	case
o	kóqin-**os**	dhísk-**os**	i	mávr-**i**	mihan-**í**
the	black	tray	the	red	motorcycle
o	mávr-**os**	niptír-**as**	i	kóqin-**i**	bál-**a**
the	black	sink	the	red	ball
o	mávr-**os**	anaptír-**as**	i	kóqin-**i**	karékl-**a**
the	black	lighter	the	red	chair

Table C2. Testing items - Task 3 - Experiment 1

Masculine			**Feminine**		
Article	**Adjective**	**Noun**	**Article**	**Adjective**	**Noun**
o	mávr-**os**	stóh-**os**	i	kóqin-**i**	thíq-**i**
the	black	target	the	red	case
o	mávr-**os**	dhísk-**os**	i	kóqin-**i**	mihan-**í**
the	black	tray	the	red	motorcycle
o	kóqin-**os**	niptír-**as**	i	mávr-**i**	bál-**a**
the	red	sink	the	black	ball
o	kóqin-**os**	anaptír-**as**	i	mávr-**i**	karékl-**a**
the	red	lighter	the	black	chair

Appendix D – Testing Items for the Oral Production Task – Experiment 1

1. o mavros elikas (UN)

a. ti ine afto?
   i. elikas
   ii. o elikas
   iii. o mavros elikas

b. ti hroma ine o elikas?
   i. koqinos
   ii. mavros
   iii. koqini
   iv. mavri

2. o mavros harakas (UN)

a. ti ine afto?
   i. harakas
   ii. o harakas
   iii. o mavros harakas

b. ti hroma ine o harakas?
   i. koqinos
   ii. mavros
   iii. koqini
   iv. mavri

3. i mavri klosti (UN)

a. ti ine afto?
   i. klosti
   ii. I klosti
   iii. I mavri klosti

b. ti hroma ine I klosti?
   i. koqinos
   ii. mavros
   iii. koqini
   iv. mavri

4. i mavri aposqevi (UN)

a. ti ine afto?
   i. aposqevi
   ii. I aposqevi
   iii. I mavri aposqevi

b. ti hroma ine I aposqevi?
   i. koqinos
   ii. mavros
   iii. koqini
   iv. mavri

5. **o mavros kadhos (TR)**

a. ti ine afto?
   i. kadhos
   ii. o kadhos
   iii. o mavros kadhos

b. ti hroma ine o kadhos?
   i. koqinos
   ii. mavros
   iii. koqini
   iv. mavri

6. **o mavros tihos (TR)**

a. ti ine afto?
   i. tihos
   ii. o tihos
   iii. o mavros tihos

b. ti hroma ine o tihos?
   i. koqinos
   ii. mavros
   iii. koqini
   iv. mavri

7. i mavri ghoma (TR)

a. ti ine afto?

i. ghoma
ii. I ghoma
iii. I mavri ghoma

b. ti hroma ine I ghoma?
i. koqinos
ii. mavros
iii. koqini
iv. mavri

8. i mavri blouza (TR)

a. ti ine afto?
i. blouza
ii. I blouza
iii. I mavri blouza

b. ti hroma ine I blouza?
i. koqinos
ii. mavros
iii. koqini
iv. mavri

9. o mavros dhiskos (UN)

a. ti ine afto?
i. Dhiskos
ii. O dhiskos
iii. O mavros dhiskos

b. Ti hroma ine o dhiskos?
i. Koqinos
ii. Mavros
iii. Koqini
iv. Mavri

10. o mavros stohos (UN)

a. Ti ine afto?
i. Stohos
ii. O stohos
iii. O mavros stohos

b. Ti hroma ine o stohos?
i. Koqinos
ii. Mavros
iii. Koqini
iv. Mavri

11. i mavri karekla (UN)

a. Ti ine afto?
i. Karekla
ii. I karekla
iii. I mavri karekla

b. Ti hroma ine I karekla?
i. Koqinos
ii. Mavros
iii. Koqini
iv. Mavri

12. i mavri bala (UN)

a. Ti ine afto?
i. Bala
ii. I bala
iii. I mavri bala

b. Ti hroma ine I bala?
i. Koqinos
ii. Mavros
iii. Koqini
iv. Mavri

13. o koqinos kadhos (UN)

c. ti ine afto?
iv. kadhos
v. o kadhos
vi. o koqinos kadhos

d. ti hroma ine o kadhos?
v. koqinos
vi. mavros

vii. koqini
viii. mavri

14. **o koqinos tihos (UN)**
    c. ti ine afto?
        iv. tihos
        v. o tihos
        vi. o koqinos tihos
    d. ti hroma ine o tihos?
        v. koqinos
        vi. mavros
        vii. koqini
        viii. mavri

15. **i koqini ghoma (UN)**
    c. ti ine afto?
        iv. ghoma
        v. I ghoma
        vi. I koqini ghoma
    d. ti hroma ine I ghoma?
        v. koqinos
        vi. mavros
        vii. koqini
        viii. mavri

16. **i koqini blouza (UN)**
    c. ti ine afto?
        iv. blouza
        v. I blouza
        vi. I koqini blouza
    d. ti hroma ine I blouza?
        v. koqinos
        vi. mavros
        vii. koqini
        viii. mavri

17. **o koqinos elikas (TR)**
    c. ti ine afto?
        iv. elikas
        v. o elikas
        vi. o koqinos elikas
    d. ti hroma ine o elikas?
        v. koqinos
        vi. mavros
        vii. koqini
        viii. mavri

18. **o koqinos harakas (TR)**
    c. ti ine afto?
        iv. harakas
        v. o harakas
        vi. o koqinos harakas
    d. ti hroma ine o harakas?
        v. koqinos
        vi. mavros
        vii. koqini
        viii. mavri

19. **i koqini klosti (TR)**
    c. ti ine afto?
        iv. klosti
        v. I klosti
        vi. I koqini klosti
    d. ti hroma ine I klosti?
        v. koqinos
        vi. mavros
        vii. koqini
        viii. mavri

20. **i koqini aposqevi (TR)**
    c. ti ine afto?
        iv. aposqevi
        v. I aposqevi
        vi. I koqini aposqevi
    d. ti hroma ine I aposqevi?

v. koqinos
vi. mavros
vii. koqini
viii. mavri

21. o koqinos anaptiras (UN)

a. ti ine afto?
   i. Anaptiras
   ii. O anaptiras
   iii. O koqinos anaptiras
b. Ti hroma ine o anaptiras?
   i. koqinos
   ii. mavros
   iii. koqini
   iv. mavri

22. o koqinos niptiras (UN)

a. ti ine afto?
   i. Niptiras
   ii. O niptiras
   iii. O koqinos niptiras
b. Ti hroma ine o niptiras?
   i. koqinos
   ii. mavros
   iii. koqini
   iv. mavri

23. i koqini thiqi (UN)

a. Ti ine afto?
   i. Thiqi
   ii. I thiqi
   iii. I koqini thiqi
b. Ti hroma ine I thiqi?
   i. koqinos
   ii. mavros
   iii. koqini
   iv. mavri

24. i koqini mihani (UN)

a. Ti ine afto?
   i. Mihani
   ii. I mihani
   iii. I koqini mihani
b. Ti hroma ine I mihani?
   i. koqinos
   ii. mavros
   iii. koqini
   iv. mavri

Appendix E – Personal Information – Experiment 1

The Influence of the L1 in the Acquisition of L2 Oral Skills – Version 1 / 2

Thank you for agreeing to participate in our study! First, we need some information about you:

Age:___ Gender:___ Full-time Education (total in years & title of degree):____

Is English your native language? Y/N

Do you have any knowledge of any other language(s)? Y/N

If yes, what language(s)? _____

Level of language(s)? _____

Approximately how many hours per week do you spend reading? (Please include reading for pleasure, work and study, in any form – book, magazine, web pages, etc.; please circle one answer)

less than 5 hours | 5-10 hours | 10-15 hours | 15-20 hours | 20-25 hours | more than 25 hours

Approximately how many hours did you spend reading last week? (Please include reading for pleasure, work and study, in any form – book, magazine, web pages, etc.; please circle one answer)

less than 5 hours | 5-10 hours | 10-15 hours | 15-20 hours | 20-25 hours | more than 25 hours

How much do you read compared to your friends? (Please circle)

Not sure | Much less | Less | About the same | More | Much more

Appendix F – Data Coding and Scoring for Experiment 1

Table F1. Data Coding and Scoring for Experiment 1

Coding	Explanation	Scoring
Trained?	Whether the item is trained or untrained	'1' for trained; '0' for untrained.
Det?	Whether the determiner is present	'1' for presence; '0' for absence.
Adj?	Whether the correct lexical adjective is present	'1' for correct lexical adjective with correct/incorrect grammatical form '0' for incorrect lexical adjective 'N/A' for absence of adjective
Noun?	Whether the correct noun is present	'1' for correct noun '0' for incorrect noun 'N/A' for absence of noun
AdjAgr	Whether there is adjective agreement	'1' for agreement when both the correct lexical adjective with the correct grammatical form and the correct noun are present '0' when both the correct lexical adjective and noun are present but there is no agreement 'N/A' when correct lexical adjective/noun is absent
DetAgr	Whether there is determiner agreement	'1' for agreement when both the correct determiner and noun are

		present ‘0’ when both the determiner and the correct noun are present but there is no agreement ‘N/A’ when determiner/noun is absent.
AdjAgrOK	The number of items with adjective agreement (adj and noun are present)	‘1’ for trained; ‘0’ for untrained.
AdjAgrX	The number of items without adjective agreement (adj and noun are present)	‘1’ for presence; ‘0’ for absence.
DetAgrOK	The number of items with determiner agreement (determiner and noun are present)	‘1’ for correct lexical adjective with correct/incorrect grammatical form ‘0’ for incorrect lexical adjective ‘N/A’ for absence of adjective
DetAgrX	The number of items without determiner agreement (determiner and noun are present)	‘1’ for correct noun ‘0’ for incorrect noun ‘N/A’ for absence of noun

Appendix G – Phonological Stem Changes for Past Tense Marking in Greek

Table G1. Phonological stem changes for the active imperfective and perfective past tense formation of first-conjugation verbs in Greek (modified, Holton et al. 2004: 141-145)

When the stem ends in:	**Example**		
	Present Tense	**Impf**	**PPT**
1. A vowel, the Impf takes the letter *-g-* and the PPT the sigmatic *-s-*	*Ak**oú**o* ‘I hear’	*ákou**g**a* ‘I was hearing	*ákou**s**a* ‘I heard
2. The vowel *–e–,* the Impf is formed regularly. The PPT takes *–efs–*	*Pl**é**o* ‘I float’	***é**ple**a*** ‘I was floating’	*épl**efs**a* ‘I floated’
3. A labial consonant *(-v-, -p-, -f-, -pt-, -ft-*), the Impf is formed regularly. The PPT takes *–ps–*	*Gráf**o*** ‘I write’	***é**gra**fa*** ‘I was writing’	*égra**ps**a* ‘I wrote’
4. A cluster containing a labial (*-av-, -ev-*), the Impf is formed regularly. The PPT takes *–aps– or –*	*ðoul**év**o* ‘I work’	***ðoú**lev**a*** ‘I was working’	*ðoúl**eps**a* ‘I worked’

	eps–			
5.	A cluster containing a labial (*-av-, -ev-*), the Impf is formed regularly. The PPT takes *–afs– or –efs–*	*ðezm**év**o* ‘I tie down’	*ð**é**zmev**a*** ‘I was tying down’	*ðézm**efs**a* ‘I tied down’
6.	A velar consonant (*-g-, -k-, -h-*) or cluster containing a velar (*-gg-, -gh-, -sk-, -hn-*), the Impf is formed regularly. The PPT takes *-ks-*	*Rí**hn**o* ‘I throw’	***é**rihn**a*** ‘I was throwing’	*éri**ks**a* ‘I threw’
7.	A dental consonant (*-ð-,-θ-*), the Impf is formed regularly. The PPT takes the sigmatic *–s–*	*Pí**θ**o* ‘I convince’	***é**piθ**a*** ‘I was convincing’	*épi**s**a* ‘I convinced’
8.	*–ss–* or *–tt–*, the Impf is formed regularly. The PPT takes *–ks–*	*Plí**tt**o* ‘I get bored’	***é**plitt**a*** ‘I was getting bored’	*épli**ks**a* ‘I got bored’
9.	*–z–*, the Impf is formed regularly. The PPT takes the	*Aðiá**z**o* ‘I empty’	***á**ðiaz**a*** ‘I was emptying’	*áðia**s**a ‘I emptied’*

sigmatic –*s*–			
10. –*n*– after a vowel, the Impf is formed regularly. The PPT takes the sigmatic –*s*–	*ð**én**o* ‘I tie’	***é**ðen**a*** ‘I was tying’	*éðe**s**a* ‘I tied’
11. –*eno*, the Impf is formed regularly. For the PPT, there are five types: a. –*an*– b. –*in*– c. Drops syllable –*en*– d. –*as*– e. –*is*–	a. *Anas**éno*** ‘I breathe’ b. *Kont**éno*** ‘I shorten’ c. *Paθ**éno*** ‘I suffer’ d. *Sop**éno*** ‘I fall silent’ e. *Arost**éno*** ‘I fall ill’	*An**á**sen**a*** ‘I was breathing’ *K**ó**nten**a*** ‘I was shortening’ *P**á**θen**a*** ‘I was suffering’ *S**ó**pen**a*** ‘I was falling silent’ *Ar**ó**sten**a*** ‘I was falling ill’	*Anás**an**a* ‘I breathed’ *Kónt**in**a* ‘I shortened’ *ép**aθa*** ‘I suffered’ *Sóp**as**a* ‘I fell silent’ *Arást**is**a* ‘I fell ill’
12. –*ar*– *or* –*ir*–, there is no Impf. The PPT takes –*aris*–/-*ir*- *or* –*ar*-/-*ir*-	*Sok**ár**o* ‘I shock’	-	*Sok**áris**a* or *sók**ar**a* ‘I shocked’

Appendix H – Existing and Novel Experimental Items for the Perfective Past Tense in Greek (Stavrakaki and Clahsen 2009; Clahsen et al. 2010)

Existing verbs

1st subclass: Sigmatic past tense

gráfo – égrapsa (‘I write – I wrote’)

kóvo – ékopsa (‘I cut – I cut’)

váfo – évapsa (‘I paint – I painted’)

2nd subclass: Sigmatic past tense

líno – élisa (‘I untie – I untied’)

péfto – épesa (‘I fall – I fell’)

díno – édisa (‘I dress – I dressed’)

pláϴo – éplasa (‘I make by hand – I made by hand’)

3rd subclass: Sigmatic past tense

tripó – trípisa (‘I bore – I bored’)

kouvaló – kouválisa (‘I carry – I carried’)

haló – hálasa (‘I break – I broke’)

1st subclass: Non-sigmatic past tense

tróo – éfaga (‘I eat – I ate’)

píno – ípia (‘I drink – I drank’)

vlépo – íða (‘I see – I saw’)

2nd subclass: Non-sigmatic past tense

pléno – éplina (‘I wash – I washed’)

spérno – éspira (‘I seed – I seeded’)

férno – éfera (‘I bring – I brought’)

jérno – éjira (‘I bend – I bent’)

Novel verbs

Sigmatic rhymes:	First subclass:	*drafo, lovo, mafo*
	Second subclass:	*vino, tefto, bino, pratho*
	Third subclass:	*kripo, jalo, nouvalo*
Non-sigmatic rhymes:	First subclass:	*proo, rino, flepo*
	Second subclass:	*fleno, skerno, lerno, verno*
	Third subclass:	*kesteno, pifeno, lonteno*
Non-rhymes:	*stótho*, *keprátho*, *strelótho*, *hrokéjo*, *gouthéno*, *kloúho*, *tapríno*, *pnekéfo*, *fapíno*, *kiróvo*	

PRACTICE ITEMS

Existing verbs:

Periméno – béno mésa (‘I wait – I went inside’)

Taΐ́zo – táisa (‘I feed – I fed’)

Anígo – ániksa (‘I open – I opened’)

Pézo – épeksa (‘I play – I played’)

Novel verbs: *tiláo, pitáo, krosízo, féno.*

Appendix I – Literacy Measurements Texts for Experiment 2

In Albanian

Year 3

Logjika

Shumë kohë më parë, në një fshat kinez, që ishte larg Shangait, në atë kohë kryeqyteti i Kinës, një plak pyeti një ditë një djalë të vogël : «Kush është më afër, Shangai apo dielli?»

-Natyrisht që dielli, -tha djali i vogël pa asnjë hezitim.

-Mirë, -tha plaku duke buzëqeshur- Pse mendon kështu?

-Është e thjeshtë, -tha djali-. Ne mund ta shikojmë diellin, por nuk mund ta shikojmë Shangain.

Year 6

Luli vocërr

Kur Luli hyn në oborr të shkollës, buza i qesh nga pak, por askujt asnjë fjalë s'i thotë. Ecën ngadalë duke shikuar djathtas e majtas, por gjithnjë duke ecur, derisa të mbërrijë në cak të vet. Aty te dera e rrugicës së shkollës shumë i pëlqen të qëndrojë. Aty është caku i tij, praruar nga rrezet e ngrohta të diellit në këto ditët e vjeshtës. Mbështetet Luli në mur, grushtet e vegjël i fut ne xhepa, hundën pjerrake, të kuqur nga të ftohtët e mëngjesit, ia kthen diellit dhe…shikon.

Year 9

Në qendrën tregtare

Prindërit na prenë biletat, na veshën patinat dhe pajisjet e tjera dhe hymë në pistë. Në fillim kisha shumë frikë, por pastaj ia mora dorën. Vëllai im, Dejvi,

shtrëngonte fort pinguinin dhe rrëshqiste ngadalë. Pranë meje rrëshqiste një djalë më i madh se unë. Ai ishte shumë i zoti. Djali më tregoi se vinte shumë shpesh të patinonte dhe tani mund të bënte figura të vështira. Pasi mbaroi koha e caktuar, dola nga pista, i falënderova prindërit dhe iu kërkova atyre që të më sillnin më shpesh aty.

In English

Year 3

Common sense

A long time ago, in a Chinese village far away from Shanghai (the capital of China at the time), an old man asked one day a young boy: 'What is nearer: Shanghai or the sun?'

- 'Surely the sun', said the young boy without any hesitation.
- 'Ok', said the old man smiling, 'but why do you think that?'
- 'It is obvious', said the young boy, 'we can actually see the sun but we cannot see Shanghai.'

Year 6

Little Luli

When Luli enters the schoolyard, he smiles a bit but says no word to no one. He walks slowly looking left and right, but always walking, until he reaches his target. He really enjoys standing at the entrance of the road that leads to the school. That is where his target is, encrusted by the warm rays of the sun during these days of autumn. Luli leans on the wall, his small fists in his

pockets, his pointed nose all red from the cold hours of the morning, he turns his back to the sun and…stares.

Year 9

In the shopping centre

Our parents booked us tickets; they put us the skates on and the rest of the equipment and we entered the track. At the beginning, I was very afraid; however, I got the hang of it afterwards. My brother, David, held on tight to his penguin and skated slowly. A boy taller than me was skating next to me. He was very good at it. The boy showed me because he would come to skate very often and now he could perform difficult jumps. After my time ended, I exited the track, thanked my parents and asked them to bring me here more often.

Appendix J – List of Excluded Testing Items – Experiment 2

Table J1. List of testing items from Konta's (2012a) study, which were excluded from Experiment 2 due to animacy

Masculine	**Feminine**	**Neuter**
O hasápis	*I balarína*	*To korítsi*
'the butcher'	'the ballerina'	'the girl'
O bakális	*I mágisa*	*To peði*
'the grocer'	'the witch'	'the child'
O farmakopjós	*I nífi*	*To voskópoulo*
'the pharmacist'	**'**the bride'	'the little shepherd'
O maθitís	*I ðaskála*	*To vasilópoulo*
'the student'	'the teacher'	'the prince'
O vivliopólis	*I fíli*	*To moró*
'the bookseller'	'the friend'	'the baby'
O mágiras	*I kóri*	*To raftópoulo*
'the chef'	'the daughter'	'the little tailor'
O ánðras	*I ginéka*	*To aðerfáki*
'the man'	'the wife'	'the little sibling'
O vasiljás	*I mamí*	*To agóri*
'the king'	'the midwife'	'the boy'
O jatrós	*I nosokóma*	
'the doctor'	'the nurse'	
O zográfos		
'the painter'		
O aθlitís		

‘the athlete’

O tahiðrómos

‘the post-man’

O ðjetitís

‘the referee’

O fotográfos

‘the photographer’

O mástoras

‘the handyman’

Table J2. List of testing items from Konta (2012a), which were excluded from Experiment 2 due to the difficulty of assigning the property of colour to them

Masculine	**Feminine**	**Neuter**
O ðrómos	*I límni*	*To stróma*
‘the street’	‘the lake’	‘the mattress’
O kaθréftis		*To kíma*
‘the mirror’		‘the wave’
O hártis		*To ágalma*
‘the map’		‘the statue’
		To kéndima
		‘the embroidery’

Table J3. List of testing items from Konta (2012a), which were excluded from Experiment 2 due to semantic ambiguity

Masculine	**Feminine**	**Neuter**
O markaðóros	*I poliθróna*	*To kaláθi*
‘the marker’	‘the armchair’	‘the basket’
		To páploma
		‘the duvet’
		To ðéma
		‘the parcel’
		To gráma
		‘the letter’
		To fórema
		‘the dress’
		To ífasma
		‘the fabric’

Appendix K – Testing Items for Singular and Number Agreement – Experiment 2

Table K1. Testing Noun Phrases - Singular Agreement (Task 2) - Experiment 2

Masculine	**Feminine**	**Neuter**
O** kókin-**os** káð-**os	*I prásin-**i** zón-**i***	*To kókin-**o** balón-**i***
'The red bin'	'The green belt'	'The red balloon'
O** prásin-**os** pínak-**as	*I kókin-**i** vivlioΘíq-**i***	*To kókin-**o** vivlí-**o***
'The green board'	'The red bookcase'	'The red book'
O** kítrin-**os** kouv-**ás	*I prásin-**i** katsaról-**a***	*To prásin-**o** ktíri-**o***
'The yellow bucket'	'The green pot'	'The green building'
O** kítrin-**os** fáqel-**os	*I prásini karékl-**a***	*To kókin-**o** ráf-**i***
'The yellow envelope'	'The green chair'	'The red shelf'
O** kókin-**os** anaptír-**as	*I kókin-**i** pórt-**a***	*To kítrin-**o** poukámis-*
'The red lighter'	'The red door'	***o***
		'The yellow shirt'
O** kítrin-**os** hárak-**as	*I kítrin-**i** lekán-**i***	*To prásin-**o** trapéz-**i***
'The yellow ruler'	'The yellow toilet seat'	'The green table'
O** kítrin-**os** íli-**os	*I prásin-**i** tileóras-**i***	*To kítrin-**o** pandelón-**i***
'The yellow sun'	'The green television'	'The yellow trousers'
O** kítrin-**os** tíh-**os	*I prásin-**i** ombrél-**a***	*To kókin-**o** paráΘir-**o***
'The yellow wall'	'The green umbrella'	'The red window'

Table K2. Testing Noun Phrases - Number Agreement (Task 3) - Experiment 2

Masculine	**Feminine**	**Neuter**
i** kókin-**i** káð-**i	*I prásin-**es** zón-**es***	*Ta kókin-**a** balón-**ia***
'The red bins'	'The green belts'	'The red balloons'
i** prásin-**i** pínak-**es	*I kókin-**es** vivlioΘíq-**es***	*Ta kókin-**a** vivlí-**a***
'The green boards'	'The red bookcases'	'The red books'
i** kítrin-**i** kouv-**áðes	*I prásin-**es** katsaról-**es***	*Ta prásin-**a** ktíri-**a***
'The yellow buckets'	'The green pots'	'The green buildings'
i** kítrin-**i** fáqel-**i	*I prásines karékl-**es***	*Ta kókin-**a** ráf-**ia***
'The yellow envelopes'	'The green chairs'	'The red shelves'
i** kókin-**i** anaptír-**es	*I kókin-**es** pórt-**es***	*Ta kítrin-**a** poukámis-**a***
'The red lighters'	'The red doors'	'The yellow shirts'
i** kítrin-**i** hárak-**es	*I kítrin-**es** lekán-**es***	*Ta prásin-**a** trapéz-**ia***
'The yellow rulers'	'The yellow toilet seats'	'The green tables'
i** kítrin-**i** íli-**i	*I prásin-**es** tileorás-**is***	*Ta kítrin-**a** pandelón-*
'The yellow suns'	'The green televisions'	***ia***
		'The yellow trousers'
i** kítrin-**i** tíh-**i	*I prásin-**es** ombrél-**es***	*Ta kókin-**a** paráΘir-**a***
'The yellow walls'	'The green umbrellas'	'The red windows'

Appendix L – Practice Items for Singular and Number Agreement – Experiment 2

Table L1. Practice noun phrases - Singular Agreement (Task 2) - Experiment 2

Masculine	**Feminine**	**Neuter**
O prásin-os vátrah-os	*I kókin-**i** bál-**a***	*To kókin-**o** louloúð-**i***
'The green frog'	'The red ball'	'The red flower'
O kítrin-os solín-as	*I prásin-**i** bloúz-**a***	*To kókin-**o** spít-**i***
'The yellow pipe'	'The green blouse'	'The red house'
O kókin-os píravl-os	*I kítrin-**i** vrís-**i***	*To prásin-**o** tiléfon-**o***
'The red rocket'	'The yellow tap'	'The green telephone'
O kítrin-os niptír-as	*I prásin-**i** klost-**í***	*To kítrin-**o** piát-**o***
'The yellow sink'	'The green thread'	'The yellow dish'

Table L2. Practice noun phrases-Number Agreement (Task 3) - Experiment 2

Masculine	**Feminine**	**Neuter**
i prásin-i vátrah-i	*i kókin-**es** bál-**es***	*Ta kókin-**a** louloúði-**a***
'The green frogs'	'The red balls'	'The red flowers'
i kítrin-i solín-es	*i prásin-**es** bloúz-**es***	*Ta kókin-**a** spíti-**a***
'The yellow pipes'	'The green blouses'	'The red houses'
i kókin-i píravl-i	*i kítrin-**es** vrís-**es***	*Ta prásin-**a** tiléfon-**a***
The red rockets'	'The yellow taps'	'The green telephones'
i kítrin-i niptír-es	*i prásin-**es** klost-**és***	*Ta kítrin-**a** piát-**a***
'The yellow sinks'	'The green threads'	'The yellow dishes'

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